Proceedings of the 3rd National Conference

Nonpoint Source Pollution Information & Education Programs

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Congress Plaza Hotel ♦ Chicago, Illinois
October 20-23, 2003

Cosponsored by

Chicago Botanic Garden
U.S. Environmental Protection Agency

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FOREWORD

Mention nonpoint source pollution to your neighbors and you're likely to be met with blank stares. So it is that we are faced with the daunting task of awakening our nation to the reality that polluted runoff is the greatest remaining obstacle to the return of lakes, rivers, and streams that are once again fit for human contact. And yet overcoming this awareness gap is only the beginning. Our ultimate challenge is how to best convince our fellow citizens to alter ingrained habits and actions that contribute to the degradation of our water resources in a hundred small insidious ways.

As evidenced by these proceedings, water resources professionals and outreach specialists are awakening to the benefits of social marketing. We are learning, for instance, that the greatest motivation for changing behaviors often rests beyond any altruistic desire to leave our planet in better shape than we found it, and instead in satisfying other more direct or selfish desires.

The presentations summarized in these papers are of great variety, yet a deliberate effort has been made to maximize relevancy to you, as well as to advance the evolution of nonpoint source outreach programs. The conference planners emphasized evaluation and lessons learned when considering which presentations to accept and how they should be summarized for these proceedings. As nonpoint source education begins to take off around the nation, especially with the advent of EPA and State Phase II Storm Water Programs compelling outreach in thousands of communities across the U.S., the quantity and quality of outreach programs is growing by leaps and bounds. We are fortunate to have begun to reap the benefits of this new largess and to offer up this collection of high caliber papers.

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These papers provide the central narrative for the Third National Conference on Nonpoint Source Pollution Information & Education Programs. Yet a large part cannot be captured adequately on paper. Three pre-conference workshops were heavily attended and highly acclaimed. Many attendees enjoyed the camaraderie of "movie night" (complete with popcorn from an old-fashioned maker) for an opportunity to see TV ads and other short videos from around the country on how everyday folk can reduce their water pollution contributions. Other perks enjoyed by conference-goers included taking in a superb multi-media presentation called "I am the Water," discovering how TV meteorologists are providing "envirocasts" and on-air tips for preventing pollution, and taking in a memorable mini-concert by Billy B.—a talented and zany environmental singer and composer.

Consider this your invitation to join us at the next Nonpoint Source Pollution Information & Education Conference and experience it all first-hand.

Don Waye
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3rd National Conference

Nonpoint Source Pollution Information & Education Programs

October 20-23, 2003 * Congress Plaza Hotel * Chicago, Illinois

Conference Agenda

Monday, October 20

9:00 a.m.-4:30 p.m. **PRE-CONFERENCE WORKSHOP #1** ..... *Gold Room*
Communicating for Results: Developing and Implementing Effective Outreach Campaigns
Charlie MacPherson and Melissa B. DeSantis; Tetra Tech, Inc., Fairfax, Va.
Jack Wilbur; Utah Utah Department of Agriculture and Food, Salt Lake City, Utah

9:00 a.m.-4:30 p.m. **PRE-CONFERENCE WORKSHOP #2** ..... *Windsor Room*
The Human Dimension of Watershed Management
Robin Shepard and Rebecca Powers; Univ. of Wisconsin - Extension, Madison

9:00 a.m.-4:30 p.m. **PRE-CONFERENCE WORKSHOP #3** ..... *Florentine Room*
Draw Them A Picture: Translating Data Into Information
Jill M. Reinhart;
Conservation Technology Information Center, W. Lafayette, Ind.

7:30-9:00 p.m. **LET'S GO TO THE MOVIES!** ..... *Gold Room*
Join your fellow conference attendees at this informal evening session to view public service announcements and video productions related to NPS outreach programs.

Tuesday, October 21

7:00 a.m.-5:00 p.m. **Conference Registration** ..... *Francis Room*

7:00 a.m.-9:00 a.m. **Buffet Breakfast** ..... *Great Hall*

(throughout conference) **EXHIBITS & POSTERS:** View Exhibits and Posters presented by nonpoint source pollution outreach specialists from across the country ..... *Belmont & Plaza Room*

9:00-9:45 a.m. **WELCOMES AND OPENING REMARKS** ..... *Gold Room*
Barbara Whitney Carr; President and Chief Executive Officer,
Chicago Botanic Garden, Glencoe, Ill.

Craig E. Hooks; Deputy Director, Office of Wetlands, Oceans & Watersheds,
U.S. Environmental Protection Agency, Washington, D.C.

I AM THE WATER

A special exploration of sight and sound.
Produced by Robert M. Korth, University of Wisconsin-Extension, Stevens Point, Wis.

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Tuesday, October 21 *(continued)*

9:45-10:15 a.m. **PLENARY SESSION** ..... *Gold Room*

The Nonpoint Source Pollution Outreach Toolbox: What the Heck is It, and Why Should I Care?
Jack Wilbur; Information and Education Coordinator, Utah Nonpoint Source Task Force, Utah Department of Agriculture and Food, Salt Lake City, Utah; *and*
Don Waye; Nonpoint Source Outreach Coordinator - Headquarters Office, U.S. Environmental Protection Agency, Washington, D.C.

10:15-10:45 a.m. **Break**; Exhibit & Poster Viewing *Belmont & Plaza Rooms*

10:45-11:45 a.m. **KEYNOTE ADDRESS** ..... *Gold Room*

The Livable Neighborhood Water Stewardship Program: A Success Story in Behavior Change and Public Participation
David Gershon; Chief Executive Officer, Empowerment Institute, Woodstock, N.Y.

11:45-1:45 p.m. **LUNCHEON & ADDRESS** ..... *Great Hall*

Partnering with the Media: How Local Television Meteorologists Can Contribute Significantly to Nonpoint Source Pollution Awareness
David F. Jones; former meteorologist at NBC4 WRC-TV in Washington, D.C., current president of StormCenter Communications, Ellicott City, Md.

1:45-3:15 p.m. **SESSION A: INTERACTIVE WORKSHOP** ..... *Gold Room*

The Livable Neighborhood Water Stewardship Program: Beyond the Keynote Address!
David Gershon; Chief Executive Officer, Empowerment Institute, Woodstock, N.Y.

1:45-3:15 p.m. **SESSION B: WATER FESTIVALS AND COMMUNITY EVENTS** ..... *Windsor Room (1st floor)*

MODERATOR: Kathy Shay; City of Austin Watershed Protection, Austin, Texas

The Outcomes are Coming!
Susan Gorman; PioneerWest, Albuquerque, N.M., *and*
John A. La Rocca; The Rensselaerville Institute, Rensselaerville, N.Y.

Water Festivals: Kick It Up A Notch!
Curry Rosato; City of Boulder, Colo.

Texas SmartScape Lawn and Garden Showcase
Deb Bliss; City of Plano, Texas

3:15-3:45 p.m. **Break**; Exhibit & Poster Viewing ..... *Belmont & Plaza Rooms*

3:45-5:15 p.m. **SESSION A: SOCIAL MARKETING & TARGET AUDIENCE EVALUATION** ..... *Gold Room*

MODERATOR: Sarah Lehmann; U.S. EPA - Region 5, Chicago, Ill.

The "5 Things You Can Do for Your River" Campaign
Kevin G. Mercer; RiverSides Stewardship Alliance, Toronto, Ontario

Pilot Watershed Education Program for the Brooker Creek Watershed in Pinellas County, Florida
Melissa B. DeSantis; Tetra Tech, Inc., Fairfax, Va.

The Outreach Continuum: Moving Participants from Information to Action
Lynda Ransley; Snohomish County Public Works, Everett, Wash.

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Tuesday, October 21 *(continued)*

3:45-5:15 p.m. **SESSION B: BUILDING EFFECTIVE & BROAD-BASED COALITIONS** ..... *Windsor Room*
MODERATOR: Terry Branch; U.S. EPA - Region 6, Dallas, Texas

Building an Environmental Education Collaborative in Your Community
Margit Brazda Poirier; Water Education Collaborative, Rochester Museum and Science Center, Rochester, N.Y.

RiverSmart: Public Education through Grassroots Communications
Glin S. Varco; River Network, Portland, Ore.

Underserved Groups as Part of Community Watershed Protection: Building Inclusive Programs
Robin D. Chanay; Diversity and Inclusion Trainer, Washington, D.C.

5:15-7:00 p.m. **HOSPITALITY RECEPTION**..... *Grant Park Room (3rd floor)*

Wednesday, October 22

7:00 a.m.-1:30 p.m. **Conference Registration**..... *Francis Room*

7:00-8:30 a.m. **Buffet Breakfast**..... *Great Hall*

8:30-10:00 a.m. **SESSION A: EFFECTIVE OUTREACH APPROACHES FOR URBAN AREAS**..... *Gold Room*
MODERATOR: Nhien Pham; U.S. EPA - Region 5, Chicago, Ill.

Reaching Multiple Audiences with One Droplet: The Salt Lake County Storm Water Coalition's Media Outreach Campaign
Lisa A. Hartman; Hartman Management Group, Inc., Sandy, Utah

Selling Storm Water Protection Behaviors in MS4 Communities
Barbara Welch; Maine Department of Environmental Protection, Augusta, Maine

Adopt-A-Catch-Basin
Neal Shapiro; City of Santa Monica, Calif.

8:30-10:00 a.m. **SESSION B: INNOVATIONS FOR RAISING PUBLIC AWARENESS**..... *Windsor Room*
MODERATOR: Chris Davis; Illinois Environmental Protection Agency, Springfield, Ill.

"Grow Green": How to Have A Healthy Landscape AND Healthy Kids, Dogs, Birds, and Water
Kathy H. Shay; City of Austin Watershed Protection, Austin, Texas

"Beneath the City of Ooze": Reaching Youth through Adventure Books
Doug Peterson; University of Illinois - Extension, Champaign, Ill.

Project "SIGNS": Increasing Watershed Awareness through Signage and Public Education
Nancy Ellwood; Mill Creek Watershed Council, Cincinnati, Ohio

10:00 a.m. ***sharp!*** **GROUP PHOTO** ..... *Great Hall*

10:10-10:30 a.m. **Break**; Exhibit & Poster Viewing ..... *Belmont & Plaza Rooms*

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Wednesday, October 22 *(continued)*

10:30 a.m.-noon **SESSION A: REACHING OUT TO LOCAL COMMUNITIES** ..... *Gold Room*

MODERATOR: Thomas Davenport; U.S. EPA - Region 5, Chicago, Ill.

Take the "Florida Yards and Neighborhoods" Program and Call Me in the Morning: A Cure for the Environmentally Challenged Landscape
Christine A. Kelly-Begazo; University of Florida, Gainesville, Fla.

Reaching Out With Science to Help Communities Make Decisions
Paul M. McGinley; University of Wisconsin - Extension, Stevens Point, Wis.

All I Want to Know . . . Is My Program Successful?
Amy B. Bodwell; Brookfield Zoo, Brookfield, Ill.

10:30 a.m.-noon **SESSION B: INTERACTIVE WORKSHOP** ..... *Windsor Room*

Building Community Partnerships to Broaden Your Outreach
Melissa B. DeSantis; Tetra Tech, Inc., Fairfax, Va.

10:30 a.m.-noon **SESSION C: INTERACTIVE WORKSHOP** ..... *Florentine Room (3rd floor)*

Hands-On NPS Education: Connecting With Teachers and Students Through "Healthy Water, Healthy People"
Lynette Hartman Crighton; Hoosier RiverWatch, Indianapolis, Ind.; *and*
Susan M. Schultz; Indiana Project WET, Indianapolis, Ind.

noon-1:30 p.m. **LUNCHEON, ENTERTAINMENT & ADDRESS** ..... *Great Hall*

Seizing the Power of Music for Environmental Outreach
Billy B.; Billy B. Productions, Silver Spring, Md.

1:30-2:00 p.m. **Break**

2:00 p.m. **All Conference Attendees Assemble in the Windsor Room** (located on the first floor)
*(don't forget your **nametag**, and bring a coat appropriate for the weather)*

2:15 p.m. ***sharp!*** Buses depart Hotel to Chicago Botanic Garden for afternoon Session, Tours, and Dinner

3:15-4:45 p.m. **PLENARY SESSION** ..... *Auditorium*

We're from the Media, and We're Here to Help! *at Chicago Botanic Garden*

MODERATOR: Susan Markgraf; Chicago Botanic Garden, Glencoe, Ill.

Sheryl DeVore; Assistant Managing Editor, Pioneer Press, Waukegan, Ill.
Lester Graham; Senior Editor, Great Lakes Radio Consortium, Ann Arbor, Mich.
John Cody; General Assignment Reporter, WBBM Radio, Chicago, Ill.
Rebecca F. Grill; Account Manager, Karen May Communications, Highland Park, Ill.
Julie Deardorff; Environmental Reporter, Chicago Tribune, Chicago, Ill.

4:45-6:30 p.m. **VIEW THE GARDENS AND LAKES OF THE CHICAGO BOTANIC GARDEN** ..... *refer to special handout for tour options and details*

6:30-7:30 p.m. **RECEPTION** ..... *Educational Greenhouses at Chicago Botanic Garden*

7:30-9:30 p.m. **CANDLELIGHT DINNER** ..... *Great Hall at Chicago Botanic Garden*

9:30-10:00 p.m. **Return Bus Transportation to the Congress Plaza Hotel**

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Thursday, October 23

7:00-8:30 a.m. **Buffet Breakfast**..... *Great Hall*

8:30-10:00 a.m. **SESSION A: REACHING NEW PARTNERS IN THE LOCAL COMMUNITY**..... *Gold Room*
MODERATOR: Sarah Lehmann; U.S. EPA - Region 5, Chicago, Ill.

Nonpoint Source Education for Municipal Officials (NEMO): Making It Work for Your State
Patti Hurley; Alabama Dept. of Environmental Mgm't, Montgomery, Ala.

Tennessee Growth Readiness: Water Quality Matters
Joel M. Haden; Tennessee Valley Authority, Knoxville, Tenn.

Innovative Partnerships for Public Outreach on Private Well and Septic System Management
Thomas H. Miller; Univ. of Maryland Cooperative Extension, Queenstown, Md.

8:30-10:00 a.m. **SESSION B: ENHANCING PROFESSIONAL DEVELOPMENT OPPORTUNITIES FOR TEACHERS**..... *Windsor Room*
MODERATOR: Rosetta Fackler; Kentucky Division of Water, Frankfort, Ky.

Kentucky Nonpoint Source Partnerships for Excellence in Water Quality Education
Rosetta Fackler; Kentucky Division of Water, Frankfort, Ky.

Environmental Education Materials: Guidelines for Excellence
Megan Gavin; U.S. Environmental Protection Agency-Region 5, Chicago, Ill.

A Watershed Approach to Increasing Teacher Confidence and Competency
Donna Bero; Adopt-A-Watershed, San Francisco, Calif.

10:00-10:30 a.m. **Break**; Last Chance for Exhibit & Poster Viewing!..... *Belmont & Plaza Rooms*

10:30 a.m.-noon **SESSION A: STATE & REGIONAL APPROACHES**..... *Gold Room*
MODERATOR: Kathy Shay; City of Austin Watershed Protection, Austin, Texas

Maine's Dirty Little Secret: Selling the Concept of Soil as a Pollutant
Kathy M. Hoppe; Maine Department of Environmental Protection, Presque Isle, Maine

Strengthening Education on Environmental Policy: Experience with Pennsylvania's Nutrient Management Act Regulatory Review
Alyssa Dodd; Penn State University, University Park, Pa.

Public Education and Sediment Pollution Trading: The Piasa Creek Watershed Project
Alley Ringhausen; Great Rivers Land Trust, Alton, Ill.

10:30 a.m.-noon **SESSION B: NEW APPROACHES FOR EDUCATION & TRAINING**..... *Windsor Room*
MODERATOR: Christine Anderson; U.S. EPA - Region 5, Chicago, Ill.

Solving the National Shortage of Watershed Managers: The Watershed Leadership Institutes
Heather K. Holland; Center for Watershed Protection, Ellicott City, Md.

Enhancing Leadership and Managing Conflict through the "Know Your Watershed" Program
Jill M. Reinhart; Conservation Technology Info. Center, W. Lafayette, Ind.

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Thursday, October 23 *(continued)*

noon-1:30 p.m. **LUNCHEON & CONCLUDING REMARKS**..... *Great Hall*

What Have We Learned . . . What Does It All Mean . . . Where Do We Go From Here?

John A. La Rocca; Vice President, The Rensselaerville Institute, Rensselaerville, N.Y.

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The Nonpoint Source Pollution Outreach Toolbox: What the Heck is it, and Why Should I Care?

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Abstract

In April 2000, the states (under the Association of State and Interstate Water Pollution Control Administrators) and EPA formed a national Nonpoint Source Outreach Workgroup (Workgroup) to help address the information, education, and outreach needs of the nonpoint source (NPS) community. The mission of the Workgroup is to raise public awareness while generating positive behavioral changes regarding NPS pollution problems and solutions. The Workgroup conducted focus groups and consulted with several behavior change experts to determine the best methods for reaching the general public with personal stewardship messages to control NPS pollution impacts. Ultimately, the Workgroup decided that the most effective way to reach the public would be to provide the information and tools necessary for state and local agencies, as well as community and watershed organizations, to launch their own locally tailored NPS pollution outreach campaigns.

The unifying concept of the Workgroup's effort is the "NPS Outreach Toolbox." This metaphorical toolbox will hold multiple tools to assist local leaders in their NPS outreach efforts. These products will be provided to each state for them to distribute to local watershed communities, and will also be made available through U.S. EPA to any group or individual upon request. Certain toolbox products will be freely available from the Web. The toolbox will offer strategies for changing personal behaviors that contribute to NPS pollution, focusing on what people can do right where they live to prevent NPS pollution (i.e., personal stewardship).

By spring 2004, the first two phases of the toolbox are expected to be completed: 1) a how-to guide entitled *Getting in Step: A Guide for Conducting Watershed Outreach Campaigns*, with a companion 35-minute video; and 2) a CD-ROM compendium of sample outreach materials (in various formats) that could be used by local communities to address specific local problems and barriers to adopting better habits. A third phase of the toolbox, in which new generic outreach materials would be produced to fill specific identified voids and made available to local groups, is being considered. Need and funding availability will ultimately determine whether the third phase of the toolbox is undertaken.

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Getting in Step: A Guide for Conducting Watershed Outreach Campaigns expands upon an outreach guide from 1998 titled *Getting in Step: A Guide to Effective Outreach in Your Watershed*, available at <http://www.epa.gov/owow/watershed/outreach/documents>. The expanded guide offers new guidance on:

- Incorporating community-based social marketing techniques into watershed outreach campaigns;
- Determining which personal behavior(s) a local campaign should focus on; and
- Deciding which outreach tool(s) is best suited to address the needs of the target audience(s) of a particular community.

The expanded guide also provides information on conducting outreach using television, radio, print media, water bill inserts, hotlines, discount cards, presentations, and community-based events such as watershed fairs and contests.

A video version of the *Getting in Step* guide has also been produced as a companion tool to the guide. The 35-minute video showcases four community watershed outreach efforts around the country and the various outreach techniques the communities integrated into their efforts to accomplish their goals. These case studies are described briefly below:

- In Lancaster County, Pennsylvania, watershed project coordinators addressed sediment and bacteria problems along Mill Creek by targeting their outreach efforts at Amish dairy farmers. It was important that project coordinators first learned about—and understood—Amish culture. Coordinators knew they had to visit Amish farmers in person because the farmers did not have telephones, radios, or televisions. They also understood that the Amish would be more likely to take on projects to improve water quality if the projects appealed to their desires to improve herd health and did not hurt their bottom line. Through marketing techniques designed with the Amish audience's unique needs and lifestyle in mind (such as hosting barn meetings), the Mill Creek project to buffer streams and fence cattle away from stream banks was much more successful than it might have been otherwise.
- In Cannon Township, Michigan, city leaders wanted to preserve the quality of Bear Creek amid rapid growth and urbanization. Project leaders used community events and school outreach to get their message out and promoted adoption of a stream overlay district that provided open space and buffer zones near the creek. The annual water festival, the town newsletter, a theater troupe that performed natural resource-theme skits at schools, and public meetings were the main vehicles city leaders used to promote the water quality protection efforts.
- Across the country in San Diego, California, city leaders faced their own public relations dilemma: how to get the word out about stormwater pollution to 1.2 million residents in an effort to reduce the number of beach closings attributed to bacteria from urban runoff. Baseline market research data indicated that a majority of residents did not fully understand stormwater pollution or the potential contributions of individual citizens. Because mass media is often effective at raising awareness among large public groups, the city started a mass media campaign after carefully analyzing the demographics and cultural composition of the communities in and around San Diego. The "Think Blue" message started showing up on bus boards and roadside billboards, in newspaper ads, and on radio and television. The campaign also promoted the city's Web site as a place to get more in-depth information <http://www.thinkblue.org/>. The "Think Blue" message was also taken to community events, fairs, and concerts. The result was a 33 % drop in the number of beach closures after the first full year of the campaign.
- Finally, in Salt Lake City, Utah, a group of elementary school children used the news media in their crusade to preserve a section of a local creek. The kids found themselves up against developers and the city, which planned to pave over a small length of Parleys Creek to build a parking lot as part of a new shopping center. The children and their adult leaders invited the media to every event they held at the creek and every public meeting they attended about the development. The youth conducted letter-writing campaigns and petition drives. They partnered with local and state agencies interested in protecting wildlife and the environment. In the end, the young people won a conservation easement for the area and secured funding for a nature park and outdoor classroom.

The updated guide and video are scheduled to be released by EPA this autumn (2003). A key to success of this first phase of the NPS Outreach Toolbox is the distribution of the teaching guides. The distribution plan will place guides and videos in the hands of state NPS coordinators throughout the

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country, who in turn will be asked to distribute the guides to local groups and municipalities within each state that have an interest or need to perform NPS outreach. Even with broad distribution, however, the Workgroup is concerned that many of the guides may not be fully used without some sort of training. Thus, the Workgroup, along with a consultant team, has developed an eight-hour *Getting in Step* training workshop. While usually offered free to the participants, the true cost of the workshop training session is approximately $5,000 to $8,000, which includes time, travel, and materials for two qualified *Getting in Step* trainers. This is the approach that Maine used in September 2003 when state NPS officials invited instructors from Tetra Tech to conduct a one-day *Getting in Step* workshop for representatives from the Phase II stormwater municipalities throughout the state. Fifty people attended this EPA-funded training, and responses on the evaluation forms were very positive.

NPS Outreach Workgroup co-chair Jack Wilbur, of the Utah Department of Agriculture and Food, is piloting a do-it-yourself model of the *Getting in Step* training. Wilbur has taken the workshop from Tetra Tech instructors twice, served as an editor for the updated *Getting in Step* guide, and is an expert in media relations. He has also studied the materials extensively. With the help of one or two local partners, he has been conducting a series of regional *Getting in Step* workshops in Utah for rural and urban groups. The evaluations from his sessions have also been quite positive. Electronic copies of the Utah workshop presentation materials are available from Jack Wilbur (jackwilbur@utah.gov) for any group that desires to conduct its own *Getting in Step* training.

Collectively, the updated *Getting in Step* guide, the companion video, and the workshops comprise the first phase of the NPS Outreach Toolbox. The second phase of the toolbox is a CD, and possibly a Web site, of sample NPS outreach materials, tentatively titled the NPS Outreach Digital Toolbox. The digital toolbox CD will include:

- A featured set of video, audio, and print display public service announcements (PSAs) that have proven effective or popular in various communities;
- Proven slogans and ready-to-use logos to help identify a community's NPS outreach materials with a unifying theme;
- Printer-ready samples of popular posters, bookmarks, fact sheets, brochures, and other NPS outreach products determined to be effective or worthwhile by the Workgroup;
- An electronically searchable catalog of hundreds of NPS outreach materials in all media formats (print, audio, and video), with thumbnail images of most materials and contact information on how to obtain each catalog entry;
- A hyperlinked PDF version of the Getting in Step guide; and
- A menu-driven Web browser interface for easy access to each component element, with Web links wherever practical.

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The digital toolbox will consist of instantly usable, non-proprietary, free NPS outreach products that have already been developed by various sources, including new EPA materials created in early 2003 in conjunction with NPS Awareness Month for the President's Year of Clean Water celebration. As of September 2003, an alpha release of the digital toolbox has been created for testing and feedback by the Workgroup, and will be previewed at the Chicago NPS Pollution Information & Education Programs Conference in October 2003. The digital toolbox is scheduled for release and nationwide distribution in Spring 2004.

The Workgroup chose to feature PSAs in the digital toolbox on five specific sets of behaviors associated with personal stewardship applicable to a majority of Americans: lawn and garden care; auto/truck care; management of household chemicals; pet care; and septic system care. Information on various NPS outreach products was gathered from many angles, including: calls for outreach materials, specific requests for radio and television PSAs, on EPA's NPSINFO listserv and EPA's nationwide "Water News," a weekly online publication; information received from the 28 state and EPA

Workgroup members; and several NPS outreach repositories at EPA offices, state agencies, and EPA's consultant for developing the toolbox, Tetra Tech.

One outcome of developing the digital toolbox compendium is the identification of gaps between PSAs across a matrix of three different media (print, radio, and video) and the five focus areas of personal stewardship identified by the Workgroup. For example, while the Workgroup has tracked down several well done radio PSAs on auto care, it has not yet uncovered any radio PSAs on the importance of proper septic system maintenance. Pending availability of funds, the third phase of the toolbox is to fill these outreach gaps with new radio, television, or print PSAs.

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The Outcomes are Coming!

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Abstract

In November 2001, The Rensselaerville Institute began work with the Water Quality Protection Division of U.S. EPA - Region 6 on a project to help the region respond to requests from Congress to document the results of nonpoint source education and outreach projects. Institute staff worked with Region 6 personnel and then with the New Mexico Environment Department (NMED) Surface Water Quality Bureau staff who manage the Clean Water Act's Section 319 Nonpoint Source grant program in New Mexico.

Through a series of workshops designed and implemented by the Institute, NMED contract managers and project cooperators (contractors who use granted funds to carry out projects) were brought together to learn how to think about outcomes and results. Before long, using interactive exercises and workbooks, hearing about the principles of an outcome-based approach, and thinking about how to apply these principles to actual projects, the contract managers began to recognize themselves as investors and the cooperators to view themselves as implementers. Everyone realized that adopting this outcome-focused approach to workplan development and project implementation could lead to the results we need.

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Introduction

The outcomes are coming…the outcomes are coming! Hmmmmmm…how does that make you feel? Maybe a little bit uncomfortable, a little uneasy. How many of you awoke this morning, swung your legs out and sat on the edge of the bed, peeked out the window, yawned, stretched and whispered to yourself: "What a great day. I can't wait to get up and out there and be held accountable!" Not likely!

You are not alone. *Accountability* is not a very pleasant word. Nor, for that matter, are words like *compliance… monitoring…reports…evaluation*…even to some extent***,*** *planning.* For many of us, they just don't turn us on. For many of us, they just don't add energy to our day. Contrast these words: ***performance…success…supporting…finding answers…learning.*** These are more energetic words for most of us, and they would likely make us feel better as we sat there at the edge of the bed!

Traditional Funding Words	>	Words For Outcome Thinking
Accountability	>	Performance
Compliance	>	Success
Monitoring	>	Supporting
Reports	>	Finding Answers
Evaluation	>	Learning

I am John La Rocca, and my friend Susan Gorman and I want to tell the story of an approach to outcomes that does bring energy; one approach that we think is quite powerful. We'll tell you about the approach itself and how it is being used in a specific part of your…and our…world.

I am Susan Gorman. Like more than a few of you, I was a participant at the 2nd NPS Information and Education Conference. That conference was the beginning of a shift in my thinking. I learned about social marketing, and the importance of verifying that the behavior of my customers has really changed. Later that year, at the New Mexico Environment Department (NMED) Grant Workshop, I learned that results—outcomes—matter now, more than ever before. I learned that I am an implementer rather than a cooperator and that NMED and EPA are investors rather than funders! As investors, they want to see a return on their investment, and as an implementer, I am responsible for creating a program that gets results. Wow! You can't imagine what a revelation this was for me.

So, this is the story of the conversion of EPA Region 6 Section 319 administrators and project officers and the NMEDs Surface Water Quality Bureau (SWQB) contract managers **from funders to investors,** and the impact that this conversion has had on the cooperators who became implementers with EPA's Section 319 investment.

Background

Two years ago, The Rensselaerville Institute's Mary Marsters presented a wrap-up session at the 2nd NPS Information & Education Programs Conference. Shortly thereafter, Section 319 program officers in EPA Region 6 contacted Mary seeking help in their efforts to respond to increasing insistence from Congress to verify the results achieved by expenditure of Section 319 moneys, especially for "Outreach and Education" projects. Mary and her colleagues made brief presentations to Region 6 administrators with the clear message that the funders, and the funding mindset, were indeed part of the "problem" and needed to be the start of the solution. She indicated that the administrators needed to think of themselves, and indeed behave, as investors and not as funders. The difference—the core technology of a funder (what they know how to do best)—is to distribute money; the core technology of investors is getting a return—results or outcomes.

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That presentation led to a small project in which The Rensselaerville Institute delivered briefings and workshops to Section 319 state program administrators in four of the five states in Region 6. The intended outcome was to "convert" Section 319 programs in each state to the use of outcome thinking and the tools that support it. Initial evidence of a "conversion": a state engages in a project to change its own thinking and behavior to be in line with the investor mindset.

Within a few months of the EPA briefing in New Mexico, the NMEDs SWQB, the bureau that administers the state's Section 319 program, had signed on with The Rensselaerville Institute for a project to convert to an outcomes approach. The basic elements of the initiative are outlined below.

Introducing the Outcome Principles and Tools:

A workshop was held for project officers and appropriate staff of SWQB. The most important principles, concepts, and tools of the outcome framework for both the investor (SWQB) and implementers (collaborators and non-profits) were explained and practiced using examples taken from New Mexico's recent experience. Examples included both education/outreach projects and "on the ground" projects. This workshop set the stage for the next cycle of request for proposals (RFPs) by moving project officers and related state staff into an outcome-oriented mindset, and preparing them for the development of an outcome based RFP. Critical concepts of short- and longer-term outcomes were discussed, examined, and articulated.

Next, a workshop was held for SWQB staff and selected cooperators to present an overview of the approach, concepts, and tools and illustrate their use. Susan Gorman from PioneerWest, a successful Section 319 cooperator from Albuquerque, was an active participant at that session.

When I (Susan) received the letter inviting me to attend a workshop on outcome management, I saw this as a wonderful opportunity for professional development, so I asked the other two members of the Water Festival Team to come, too. I figured that if we were going to successfully adopt this framework, all of us needed to understand it. By this time, we knew that the next RFP for Section 319 grants would be very different from the ones we had responded to before and we needed to be prepared!

So, we arrived to find that the participants were mostly staff members of the NMED, SWQB Watershed Protection Division, the folks who manage and administer the contracts for Section 319 Projects, plus a few other cooperators like us. John introduced himself and began to present the Outcomes Framework and I naturally absorbed all of what he presented in the context of the Children's Water Festival Program.

The concepts of customers, performance targets, and verification of outcomes took shape for me. By the end of the day, we knew that the RFP that would come out in late summer would be "converted" to the new way of thinking, and we would need to respond using the principles we had learned. It was also clear that we would need to take verification of outcomes more seriously!

Developing an Outcome-Based RFP:

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Theory - This step included an on-site work session with key staff of SWQB to revise existing materials used to solicit proposals/applications from the field for NPS resources. The critical steps here involved developing clarity about what SWQB is seeking to achieve with the NPS program (Outcome Statement); about the kinds of results implementer/applicants can deliver (Target Areas); and about the givens that SWQB believes and assumptions they make. Also included was development of a revised application format.

Practice - When the RFP was issued, I compared it to the one from the previous year and found some important differences. Most of the differences related to a higher level of clarity that I, as an implementer, needed to understand.

- The Objectives section was replaced by the Givens section, which included this statement:
  - "Results Matter! SWQB must see results from all of the investments it makes in partners and contractors. This is our way of responding to federal and state calls for results. Applicants must specify that the results they propose to achieve through the project in terms of changes in people, organizations or the physical environment...not in terms of project activities."
- On the last page of the Terms and Conditions there was a new section, "Outcomes, Investor's Targets, Results," which included the Investor's Outcome Statement:
  - "Over time, if all of NMED's investments in 'on the ground' and 'Outreach and Education' projects are a wild success: **All surface water in New Mexico will meet the standards of its designated use, and ground water for municipal, domestic, and agricultural use will be available and high quality**."
- Also included was the Investor's Target:
  - **"At least 35 designated impaired reaches will be delisted because they meet at least one TMDL water quality standard by the end of the year 2007."**
- Finally, this Implementer Target was suggested:
  - "Number of children who demonstrate 'nonpoint source knowledge' or teachers/administrators who make educational changes."

- The narrative part of the application was completely changed and included these sections:
  - Project Title
  - Problem/Need Statement
  - Customers
  - Performance Targets
  - Product
  - Workplan and Milestones
  - Key Persons
  - Public Participation

Since these concepts were all explained in John's workshop, I proceeded to write my proposal, feeling confident that it would succeed.

Conducting Applicant Workshops

This full day working session was held after the RFP was issued and was designed to assist applicants (implementers) to understand the new approach of SWQB and to respond effectively to the RFP. Phone and fax critique of first drafts from applicants were accomplished within two to three weeks of the workshop. Clear, concise and straightforward materials were used to assist applicants to understand and articulate the results they predicted from their projects, as well as the progress points required to achieve those results.

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The Elements of the Outcome Management Framework

Customers

Theory - Customers are people who **directly interact** with an organization's product and its implementers. They generally have a **need or problem or are behaving in a way that the investor seeks to change.** In most cases, **they have a choice**: to stop smoking, for example, or attend school, get a job, do something different with their small woodlot, or change the way they support an environment initiative. This notion of choice is why we use the term customers! Most effective project leaders believe their approach is better suited to some potential customers than others.

Practice - The customers for the Children's Water Festivals are 4th-grade teachers and their students in the Middle Rio Grande Area (Albuquerque, Los Lunas, and Rio Rancho) and in the Santa Fe Area. The two-year project will serve 90 teachers and 2,000 students in the Middle Rio Grande (MRG) Area and 40 teachers and 1,000 students in the Santa Fe Area. The conditions and behaviors of the teachers that make it more easy or difficult to affect behavior change are:

- The personal motivation of each teacher to utilize new resources, adopt expanded curricula and modify teaching methods.
- The ability of each teacher to utilize new resources, adopt expanded curricula and modify teaching methods.
- The willingness of each teacher to make the effort required to attend the teacher workshop and make needed arrangements for students to attend the water festival.
- The ability of each teacher to encourage students to participate in the festival activities with engaged minds.

Of the 130 teachers who attend the water festivals, the 100 who attend the teacher workshops have the greatest probability of changing their behavior to include more effective water education in their classroom teaching. These teachers are much more likely to encourage students to participate in the water festival with engaged minds.

The conditions and behaviors of the students that make it more easy or difficult to affect behavior change are:

- The receptiveness of each student to new information;
- The level of concentration and mental engagement that each student brings to the water festival activities; and
- The preparation that each student has received before the water festival.

Of the 3,000 students who participate in the water festivals, most of them are receptive to new information, but perhaps half will be sufficiently engaged and prepared to really bring the lessons of the festival home, and only 20% will be truly inspired to tell their friends what they have learned.

Performance Target

Theory - High performing organizations have discovered that nothing helps to increase performance more than targets set for activities. Experience is clear; people and groups with targets outperform those who pledge best efforts to do good. One reason why targets help is that they literally provide the aiming point. Without a target, most of us hallow the process and let the results fall where they may.

Performance targets:

- Move beyond such terms as "capacity building" and "networking" to look at gains that come from the process.
- Are verifiable; they represent a change in behavior or condition that can be objectively confirmed.
- Stay under the influence of the implementer. Targets are set to be achievable even if things in the environment go astray, but they should "push the envelope" a bit. Without this rigor, it is too easy to blame external forces for shortfalls in performance.
- Get set relative to a baseline.
- Represent clear commitments, not just statements of aspiration or hope.

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Practice - The Performance Targets for the Children's Water Festival Program are:

For Teachers to:

- Continue water education in the classroom using the resources and concepts learned at the teacher workshop and festival;
- Utilize new resources, adopt expanded curricula, and modify teaching methods; and
- Take action to conserve water and protect water quality.

Of the 130 teachers who participate in the teacher workshops and water festivals, 50% will utilize the resources in the classroom and 25% will make permanent modifications to their teaching methods.

For Students to:

- Demonstrate that they can answer these questions;
  1) Why is water so important to life?
  2) What is the water cycle and why is it important?
  3) What is a watershed and how does it function?
  4) How are trees, plants, animals, people, soils, and water interdependent?
  5) How do our actions affect water quality?

6) How much water does my family use?
- Take action to conserve water and protect water quality; and
- Urge their families and friends to take action to conserve water and protect water quality.

Of the 3,000 students who attend the four water festivals, 80% will exhibit improved water knowledge, 50% will take action immediately, and 20% will continue those actions for six months.

To verify achievement of targets, we will:
- Discuss verification with teachers at the teacher workshop so that they understand the importance and the methodology.
- Include evaluation questionnaires in the teacher packets for teachers and students and, urge everyone to complete them.
- Hold a prize drawing for the schools that participate, to encourage reporting of results by teachers and students.
- Visit 12 classrooms in the MRG Area and six classrooms in the Santa Fe Area to interview teachers and students and learn what they recall from the water festival activities. Using the results from this sample, we will estimate the results for the whole customer population.

Product

Theory - Product is that program or service with specific core features that is offered to a customer or practiced by a group or organization in order to reach the performance target. More than likely, *to the customer* it is a product with clear features and benefits. As in selecting whether to buy a truck or a car, the product should be the right vehicle for your customers.

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Core Features are those design aspects of a product that are central to its working. They often include:
- **Intensity/duration** – How often does the customer interact with your product and for how long? Is there a limit to how long a customer can be engaged? Is there a minimum time of engagement for your product to be effective?
- **Essential elements** – What is it about your product that must always be present or is most critical to its success with customers? What is your "core technology?"
- **Comparative advantages** – What sets your product apart from others trying to accomplish the same thing?
- **Delivery strategy** – How do you get your customers? Once you have them, how do you keep them long enough to succeed with them?

Practice - For each area, MRG and Santa Fe, there are two components of the product: the teacher workshop and the water festival. Both components are high intensity, short duration events. The teacher workshop lasts two hours, with three-quarters of the program directly addressing water education. The water festival involves students in four hours of intensive water education.

MRG and Santa Fe Water Festivals

The MRG and Santa Fe Water Festivals will present programs of activities that cover a wide range of core curriculum areas. In all festivals, presenters will present water related facts, concepts, and values through fun, hands-on learning activities. These activities will address watershed function and health, as well as causes and prevention of non-point source pollution. Students will make "Edible Aquifers" from ice cream, ice and soda, and test their water knowledge in lively games of Water Jeopardy. They will create a mini-river, use a groundwater model to "see" how water moves underground, and run a computer model to make projections of water use into the future. They will look for "bugs" in the water to determine its purity, create a micro-watershed, purify water from the Rio Grande, and build aquifers

from sand, gravel, and water. Since high school students have proved to be such effective teachers, we will recruit more student presenters for all festivals.

MRG and Santa Fe Teacher Workshops

These workshops are designed to help the teachers prepare their students before the day of the festival. The workshop will also help teachers integrate the lessons of the festival with the core curriculum and provide them with additional resources for water education. Each teacher will receive a resource kit box filled with teaching materials and ideas.

Comparative Advantages - The Water Festival Program is synergistic with other products being offered in the target communities and every product reinforces the others. This is ensured by the participation by managers of these other products on the Water Festival Steering Committees.

Delivery Strategy - The Water Festival is offered to every 4th-grade teacher in the target community public schools and in Santa Fe to private schools, as well. Since more teachers apply to participate than can be accommodated, a selection process is used. The water festivals are offered for free, and school bus transportation is provided at no cost. The festival sites, Albuquerque Convention Center and Sweeney Center, give stature to the events. The teacher workshops, resource kits, and class visits extend the reach of the program to the classroom. The many community organizations that participate as sponsors or provide volunteers also extend the reach of the program.

Other Core Features - An outreach initiative will be implemented to encourage and assist people in other New Mexico communities to initiate planning for their own water festival event. Communities in Category 1 Watersheds will be the primary outreach targets, and will be given highest priority for workshops.

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Milestones

Theory - Traditionally, cooperators and grantees focus on workplans—the phases and steps that implementers take to provide a service. Funders tend to buy workplans and hope for the best when it comes to results. The reason they can only hope is that it is perfectly possible for a group to do everything it said it would do and fall far short of achievement for customers. In an educational program designed to change behaviors, for example, the desired result is not how many people were "reached" with information, but how many of those individuals chose to do something differently as a result of being informed.

Milestones shift the focus from what implementers do to what customers achieve. If the program is to declare success, the customer must understand the logic that gets a person from where they are now to where they are to be.

One good way to get to milestones is to start with activities and ask the question, "So what?" until you get to the finish line. For example: *People are mailed brochures and see posters. So what? So they decide to come to the Saturday workshop! People attend the workshop and say they liked it. So what? So they report that what they remember are just those points we wanted to have "stick" with them.*

Practice - To respond to the request to specify milestones for the Water Festival Program, we retained the workplan and added milestones for each task. Here are a few examples of tasks with milestones:

Middle Rio Grande Water Festival

- Task 3.0
  - ▹ Financial management - develop budget, establish project accounting method, and maintain account.
  - ▹ Objective - Provide financial management for the project; ensure that funds granted are collected.

- ▹ **Milestone - All funding is in place, and all costs are covered by funds raised**.
- Task 5.0
  - ▹ Seek and select presenters - contact activity presenters, solicit proposals, evaluate and make selections, design program, communicate with presenters, as needed.
  - ▹ Objective - Ensure the highest quality and relevance for the festival program of activities.
  - ▹ **Milestone - Program development is complete (22 presenters have activities prepared).**
- Task 6.0
  - ▹ Seek and select school groups - implement teacher communication plan, register school groups, maintain communications with teachers, as needed.
  - ▹ Objective - Enable students from a broad range of socioeconomic and cultural backgrounds and from both urban and rural areas to attend the festival.
  - ▹ **Milestone - 45 Teachers and their students are prepared to attend the festival**.
- Task 12.0
  - ▹ Festival preparation and implementation - plan and implement all necessary tasks to ensure that event occurs smoothly and project objectives are met.
  - ▹ Objective - Ensure the highest quality optimum educational experience for everyone.
  - ▹ **Milestone - 45 teachers and 1,000 students attend the festival.**
  - ▹ **Milestone - 30 teachers and 750 students are actively engaged in the activities.**
- Task 13.0
  - ▹ Evaluation - obtain feedback from teachers, students, volunteers, and presenters through evaluation surveys and personal interviews with a random sample of teachers and students who attend the festival.
  - ▹ Objective - Determine if outcomes were reached. Obtain information essential to improving future Children's Water Festivals.
  - ▹ **Milestone - Visits are made to 12 classrooms in the MRG Area to interview teachers and students to learn what they remember from the water festival activities and whether they have taken action to conserve water and protect water quality. Using the results from this sample, we will estimate the results for the whole customer population. Steering Committee's analysis of results is used to improve future festivals.**

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Key Persons

Theory - Faced with the choice of a great plan and a mediocre project manager or a mediocre plan and a great project manager, what would you choose if you were looking for results?

Human sparkplugs are more powerful than great plans, a big committee, or even a lot of money in achieving change. Sparkplugs are present in all places, although many are inhibited by conventional process models. Their characteristics include:

- **Energy**. Without it many projects will begin, but few will finish. And many will begin boldly, but end up as weak copies.
- **A Bias to Act**. Many people are at heart critics, planners, or boosters. Sparkplugs are doers. They want to solve problems, not study or decry them.
- **A Results Orientation**. Sparkplugs believe that the outcome, not process, matters most. Networking and capacity building are the means, not the end.
- **Personal Responsibility**. Sparkplugs take responsibility for their own behavior.
- **Belief in Common Good**. Sparkplugs look beyond what is good for their families and friends.
- **An Inclination to Teams**. Sparkplugs provide the juice, but know they need an engine!

Practice – I am the sparkplug for the water festivals! My firm, PioneerWest, provides project management for the Water Festival Program. So far, we have managed six successful water festival events.

The festivals have steering committees of dedicated water conservation, water protection, and environmental health educators; Cooperative Extension/4-H agents; the State Engineer Office, Water Conservation educator; the State Land Office educator; and others who are passionate about water education.

Public Participation/Intermediaries

Theory - There is an additional set of people upon whom programs often rely heavily. These people are part and parcel of your program, but you may not think of them that way. They are your intermediaries. You rely on them, but do not have direct control of them.

Practice - Each task of the workplan requires participation by various "publics" including sponsors, presenters, volunteers, teachers, and students. The festivals offer an opportunity for a wide range of organizations to work together. The list of organizations that were sponsors, supporters, and presenters for previous water festivals includes businesses, state and federal agencies, local governments, community organizations, and schools. We will continue to work to expand this list to include even more organizations, and expand the support for water education to the whole community.

Conclusion

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This is our tale of the theory and practice of the outcome approach to project management. I have been managing projects for many years and over all of those years, my approach has been evolving into an outcome approach. What The Rensselaerville Institute offers is a framework that enables the folks with money (the investors) to more clearly communicate the ***outcomes*** (the concrete, measurable results they are seeking) to the implementers (the folks who manage projects and must deliver those concrete, measurable results).

All of us who work in NPS public information and education are essentially in the clean water business. Our colleagues in the clean water business who do "on the ground" projects have developed Best Management Practices (BMPs) over the years—the toolkit of actions to take to prevent the nation's waters from becoming polluted.

We believe that the outcome framework we have described offers the process to recognize the BMPs for our information and education projects and programs. If a water festival is a BMP, when all of the teachers and students and volunteers have gone home, we will have some assurance that in the future the nation's waters will be cleaner than before!

Water Festivals: Kick it Up a Notch

Curry Rosato
City of Boulder
Boulder, CO

Abstract

Water festivals typically are one day events celebrating water resources. Beginning in 1999, Boulder Water Festival organizers recognized the need to develop an extended water festival program with the following goals in mind: 1) expand the outreach and educational benefits of the festival, 2) empower students to help teachers prepare for the festival, and 3) develop a take-home component to facilitate parent learning of water issues. With these three goals in mind, Boulder festival organizers developed the Water Festival Ambassador Program. This program expanded the festival experience to 6 weeks through a volunteer classroom activity program.

The Ambassador Program transforms the water festival from a one-day event to a six-week program in several easy steps. Teachers chose to participate in Level I or Level II (Ambassador Program). Level II participants complete at least five activities about water quality and quantity issues in the six weeks leading up to the Water Festival (over 75% of participating classes participate in Level II). This program prepares students and teachers for a more in-depth learning experience at the festival and provides a take home component that involves parents in water learning.

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Introduction

Step One: Mild or Spicy?

Three years ago in an effort to expand the outreach and educational benefits of the Boulder Water Festival, the City of Boulder festival organizers created two options of participation. Festival brochures mailed out to all fifth-grade teachers in the Boulder Valley School District indicate that teachers can participate in Level I or Level II. Level I (mild) requires teachers and their students to simply participate the day of the festival. Level II (spicy) requires teachers and classes to participate in a variety of activities and expanded programs before the festival. Teachers may choose to complete additional activities after the festival, as well.

Step Two: Bringing it Home!

Level II teachers select two students to serve as the Water Festival Ambassadors. The Ambassadors assist with classroom activities and attend a Water Festival and Level II orientation to learn more about the notebook activities and related resources available to the classroom before and after the festival.

Ambassadors also receive Water Festival t-shirts to distribute to the entire class. The t-shirts help advertise the Water Festival to other classes and involve families.

Level II teachers and students receive a water notebook complete with background information, water resources, and a variety of activities related to water quality and quantity. Teachers are asked to complete a minimum of five activities during the six weeks before the festival. In an effort to involve the family, many activities include a take-home component.

Level II teachers designate a day of the week to be "Water Day," a day where students and teachers wear their Water Festival t-shirts and complete one of the water notebook activities. The water notebook activities are as follows:

Activities to complete before the festival:

- Water: Essential for Life
- Poster Contest (Students create art work based on the festival theme.)
- Water Wizards Trivia (Students learn wild facts about water.)
- Flashflood: Climb to Safety
- Take Action (Students and teachers learn about storm drain stenciling and creek monitoring activities.)

Activities to complete before or after the festival:

- The Water Cycle and Evaporation
- Boulder Water Study (Students learn where our water comes from, how it is treated, and where it goes after we use it.)
- Collecting Macroinvertebrates
- Mapping Your Watershed

Step Three: BAM!

Over 75% of registered classes choose Level II. The Level II program has expanded the outreach component of the festival from one day of fun to accomplish the following:

- Provide background knowledge and information to better prepare the festival participants.
- Facilitate in-depth learning about watershed themes and issues.
- Empower students to participate in classroom learning in a leadership capacity.
- Connect students and teachers to their community through community action projects.
- Provide a "take home" component where students involve family members.

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Program Evaluation

In an evaluation, teachers who participated in Level II agree that the program is an effective way to inform students and create interest in the festival. Many of the teachers surveyed feel that their school's ambassadors helped improve participation of other students. Additional teacher responses include:

- "The program is an effective way to inform students and create interest in the festival."
- "The classroom activities are excellent."
- "Participating in Level II allows the class to be better prepared to think about water issues when they are at the festival. The activities make the festival more educational."

Program Costs

Level II costs include, but are not limited to, purchasing of the festival t-shirts, creation of the Water Festival Notebook, and staff time associated with the Ambassador Training.

Conclusion

In just three years, the Level II program has created an opportunity for over 2,700 students to learn more about local water resources and associated water quality issues through water activities in the classroom and throughout the community. In addition, these students have involved parents and thus, expanded water learning beyond the classroom to the broader community.

Texas SmartScape Lawn and Garden Showcase

Deborah Bliss
Heather Merchant
City of Plano
Plano, Texas

Abstract

The *Texas SmartScape Lawn & Garden Showcase* is an annual, educational, one-day special event planned and organized to teach Plano residents how to design and maintain water-conserving, biologically diverse landscapes using environmentally friendly yard care practices. It targets common lawn care practices that are contributing to stormwater pollution and wasteful use of our dwindling water supplies in the North Texas region. Participants have the opportunity to hear speakers on native and adapted plants, landscape design, integrated pest management, soil preparation and the use of compost and mulch, drip-irrigation systems, best trees for the area, and lawn care tips. They also can take part in informational and interactive displays, tours of Plano's Backyard Compost Demonstration Site and Household Chemical Reuse Center, and purchase Plano Pure Compost and native plants. This special event was first conceived, developed, organized, and run through a partnership between the Solid Waste Division's Compost and Special Wastes Divisions, the Public Works Division's Water Education Department, the City of Plano Master Composters, and the Collin County Master Gardener's Association.

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Beginnings

The idea for the Texas SmartScape Lawn & Garden Showcase developed in January 2002 after Plano staff attended a North Central Texas Council of Governments Storm Water Educator's meeting. At the meeting they learned that North Texas water sampling showed elevated pesticide, herbicide, and nutrient levels. Several Plano public educators were in attendance, and together they brainstormed the idea for this event. The first Texas SmartScape Lawn & Garden Showcase was held at the City of Plano Parkway Service Center, 4120 West Plano Parkway, on Saturday, March 23, 2002. The second annual Showcase was held in the same location on Saturday, March 22, 2003. The service center provided the ideal location, being home to both the City's Backyard Compost Demonstration Site and Household Chemical Reuse Center.

Problem

Manicured, over-fertilized yards and gardens, with limited biological diversity and huge water requirements, dominate Plano's residential neighborhoods. Because of this, many of our citizens unknowingly contribute to problems of stormwater runoff and pollution, putting pressure on dwindling North Texas water supplies. Residents try to garden and maintain their landscapes on the native, unimproved clay and caliche soils, without the use of compost or mulch. These unimproved and unprotected soils contribute to problems of over-fertilization, over-watering, and increased runoff into Plano's stormwater systems.

Inspiration

Fifty-five local North Texas governments voluntarily worked together through the North Central Texas Council of Governments (NCTCOG) to develop a comprehensive gardening reference CD. Known as Texas SmartScape, the CD carries a database listing more than 200 species of native and adapted plants for North Texas. The goal is that, over time, the effects of educating the public in TX Smart gardening will be measurable in improved water quality. The Texas SmartScape program is now a Web site at <http://www.txsmartscape.com/>. The Texas SmartScape program provides information customized to the climate and soil in North Texas in the form of a complete gardening class. It also can be useful as a reference that helps to create TX Smart gardens that:

- Limit the need for excess water, pesticides, and fertilizers;
- Attract hummingbirds, butterflies, lizards, and beneficial insects;
- Provide aesthetic, economic, and environmental benefits; and
- Are safe places for humans, animals, and plants.

Purpose

The purpose of the Texas Smartscape Lawn & Garden Showcase is to provide Plano citizens with information and tools for improving soil fertility and creating water-conserving, biologically diverse, and healthy landscapes. Our goals are to promote the concepts outlined in the Texas Smartscape CD:

- Using water and drought tolerant native and well-adapted plants;
- Implementing water-conserving principles in landscape design;
- Using the most environmentally friendly and least toxic pest control practices; and
- Using compost to improve soil structure, fertility, and water holding capacity.

Additional goals include: modeling these principles for participants, involving them in interactive situations focused on these concepts, and offering compost and native plants for sale during this event.

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Location

The site for the showcase event was specifically chosen because of its large open field adjacent to the City of Plano's Backyard Compost Demonstration Site, the Household Chemical Reuse Center, the City Warehouse, parking facilities, and the natural creek bordering one side of the showcase area. In addition to its focus on compost education, the Backyard Compost Demonstration Site also has an extensive landscape featuring the use of native and well-adapted plants. The Backyard Compost Demonstration Site underwent extensive renovation before the Texas Smartscape Lawn & Garden Showcase, making it an ideal example for participants of the showcase to tour. The Household Chemical Reuse Center provides usable household, yard care, and automotive products free to Plano residents. The showcase offered a good opportunity for residents to become familiar with this facility, and to put recycling principles into practice by choosing from the least-toxic yard care products available. The City Warehouse offered us a convenient location from which to sell Plano Pure Compost and brown Kraft yard bags to participants at the event. The 2003 showcase event generated Plano Pure Compost sales of over $5,000 in a four-hour period.

First Event and Lessons Learned

The first Texas SmartScape Lawn & Garden Showcase was held at the City of Plano's Parkway Service Center on Saturday, March 23, 2002 attracting about 350 attendees. Under the cover of a canopy, guest speakers made presentations to audiences of 15 to 40 people on the subjects of native plants, Integrated Pest Management, irrigation, and compost. Ten exhibit tables circled the field. Plano's Master Composters and student volunteers fought the wind in keeping their props and literature in place as participants stopped at each station. Compost sales were brisk, with compost pile building demonstrations in the Compost Demo Site. The Household Chemical Reuse Center was open for extended hours. Free Texas SmartScape CDs drew many people. Master Composter volunteers provided orientation and hands-on experience with the CD in a nearby building.

We learned that:

- There was a large group of residents eager for information on how to have a successful garden in Texas.
- Tents were needed for inclement weather.
- We could expand on the amount of information provided within the same time frame.
- Tapping other gardening groups as resources would make the event easier for us and more interesting for the participants.
- Volunteers needed to have a staff coordinator to contact before, and the day of the event, as well as a written overview and details on their particular role within the event.

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Event Number II

The second annual *Texas SmartScape Lawn & Garden Showcase* was held at the same location on Saturday, March 22, 2003 from 10:00 am – 2:00 pm, drawing an estimated 800 people, more than double that of the previous year. Sixty volunteers were involved in helping staff the event. The number of speakers, exhibits, and vendors increased, as well. We rented two larger tents and made good use of the adjustable side flaps to accommodate the weather changes during the day. Exhibit tables were in one tent, speakers in the other.

Publicity

To get the word out for both events we used:

- An article in a direct mail newsletter,
- Utility bill inserts to 64,000 households,
- Flyers at Plano schools, libraries, recreation centers, and municipal buildings,
- Information on the Plano and NCTCOG Web sites**,**
- Notices in the calendar sections of the local newspapers,
- A banner posted on-site two weeks before the event,
- Local garden clubs, as volunteers were recruited, and
- Plano Television Network news segments and televised calendar.

Schedule and Displays

Participants at the showcase had the opportunity to hear speakers on native and adapted plants, landscape design, Integrated Pest Management, soil preparation and the use of compost and mulch, drip-irrigation systems, best trees for the North Texas region, and lawn care tips. They could also take part in informational and interactive displays, tour the Backyard Compost Demonstration Site, and purchase Plano Pure Compost and native plants. The following program lists the events, speakers, and displays.

Schedule of Events

- 10:00 am: Dedication of Children's Environmental Discovery Garden

Speakers

- 10:20 am: "Soil Preparation and Mulch: Key to Successful Gardens" Pam Farmer, Master Gardener
- 10:50 am: "Designing Your Garden Getaway with Earthkind Roses and Texas SuperStar Plants" Nancy Furth, Master Gardener
- 11:20 am: "Native Perennials for North Texas" Sarah Rife, Owner, Sarah's Habitat Nursery and Landscaping
- 11:50 am: "The How-tos of Drip Irrigation" David Garrison, Landscape Architect, Garrison Gardens
- 12:20 pm: "Garden Solutions Without Chemical Pollution" Dallas Organic Gardening Club
- 12:50 pm: "Best Trees for Texas" Renee Burke-Brown, Urban Forester, City of Plano
- 1:20 pm: "Tips for Texas Lawn Care" Susan Owens, Master Gardener

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Plano Pure Compost and Wood Mulch Sales
$3.75 per bag - Compost
$5.00 per bag - Topdressing
$3.50 per bag - Wood Mulch
(Across the street at the Warehouse)

Household Chemical Reuse Center open extended hours
8:00 am - 2:00 pm

Tabletop Displays:

- Compost Uses and Benefits Information
- SmartScaping Your Landscape
- WaterWise Practices
- Pest Solutions
- Master Gardener Information
- Plano Pure Products Information
- Plano Heritage Herb Club
- Dallas Organic Gardening Club

Tabletop Activities:

- Enviroscape Model – Effects of stormwater runoff on water quality demonstration
- Junior Master Gardener activities for children
- Master Gardener soil analysis consultations
- Rain sensor and rain gauge giveaway

- Bald Cypress trees, tree posters, and *Texas SmartScape CD* giveaway

Vendor Tables:

- Sarah's Habitat Nursery and Landscaping
- Texas Seasons
- Rainbird Irrigation Display
- Lawn Bag Holder Display

At the Warehouse:

- Plano Pure Compost and Wood Mulch Sales
- Sale of Kraft landscape debris bags

At the Backyard Compost Demonstration Site:

- Landscaping and design principles stations
- "Smart plants" displayed
- Compost bins on display
- Compost pile building demonstrations
- Questions and answers station – plants, landscaping, and composting

At the Household Chemical Reuse Center:

- Extended hours of operation

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Collaboration

Partnerships with the Plano Master Composters, Collin County Master Gardeners' Association, Dallas Organic Garden Club, and the Plano Heritage Herb Club added many new dimensions to the *Showcase* event. Because of these partnerships, we were able to offer speakers, activities, displays, and resources that expanded the expertise, scope, and offerings of the event.

Master Composters, Master Gardeners, and the Service Learning Students from the Collin County Community College provided the volunteer power to staff the event. The Master Gardener Association provided several speakers. A total of sixty volunteers participated in greeting, educating, and serving the public.

Three Plano Public Works Divisions collaborated on the event: The Solid Waste Division's Compost and Special Waste Divisions, and the Public Works Water Education Division, who planned, developed, organized, and implemented the event. Five additional departments within the city provided supplemental support. This included the Parks and Recreation Department, who helped with the irrigation system and fire ant control, the native tree presentation by their Urban Forester, and the consultation on the Compost Demonstration Site renovations by their Landscape Architect. The Streets Division provided barricades and signs, the Plano Television Network loaned the use of a generator, the Fire Department helped by transporting the generator, the Parks and Recreation Department provided instruction and loan of a sound system, and the Compost Division delivered the bagged Plano Pure products for sale.

Evaluation and Mailing List

Program cards with the Texas Lawn & Garden Showcase schedule were distributed to participants as they entered the event. The back side of this card was an evaluation response for the event. Participants

were asked to fill out the evaluations and return them to the registration table as they left the Showcase. Of the 226 evaluation cards returned, 223 rated the event "good" to "excellent," with 172 rating it "very useful." An average of 75% of the participants stated they planned to use concepts learned in the compost, water-smart, and low-impact pesticide presentations and displays. The majority of respondents indicated an interest in participating in one or more of the related city programs: the Yardwise Class series, the annual Master Composter training, learning how to create a demonstration Texas SmartScape yard, Integrated Pest Management, Household Chemicals, or volunteering at the Reuse Center. A list of names and addresses was compiled to send out notices when these classes are scheduled later in the year.

Community Impact

The Texas Smartscape Lawn & Garden Showcase has impacted the Plano community by educating residents about more environmentally friendly yard care practices, and encouraging them to implement these practices. By doing this, they are helping to reduce the amount of pollutants entering our stormwater system. These same residents are also utilizing water conservation practices in their yard care maintenance programs, helping us to protect our decreasing North Texas water supplies.

We gave away 169 rain sensors, which turn off automatic irrigation systems when it begins to rain. As residents tell their neighbors about them there is a snowball effect. These neighbors call to ask for a rain sensor of their own. We also generated high interest in the use of compost for improving soil fertility and helping with water conservation. Our sales of Plano Pure Compost, topdressing, and mulch have increased dramatically since the showcase event in March 2003, and many of the customers are repeat customers who tell us that they first learned about our products at the event. The showcase has also allowed us to distribute nearly 1,000 *Texas SmartScape CD*s to Plano residents. We know from these residents' feedback that they are sharing the information on TX Smartscaping principles and the Web site with many other friends in the community and around the state. The impact from this event is happening one citizen and one neighborhood at a time, but the cumulative effect from the combined efforts of these individuals and neighborhoods is having a positive environmental impact in our community. Local nurseries are beginning to stock more native plants because of customer requests.

The high turnout for this event, with a large increase in attendance over the previous year, coupled with the high evaluation return rate, positive responses to the event, successful compost sales, and record number of visitors to the Reuse Center, have convinced us that this was a highly successful event. We believe that we brought in and met the needs of our target audience who were definitely ready for**,** interested in, and enthusiastic about the information presented. Lists are already being formed and contacts made to expand and improve the event for 2004.

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The "5 Things You Can Do for Your River" Campaign

Kevin Mercer
RiverSides Stewardship Alliance
Toronto, Ontario

Abstract

"*5 Things You Can Do For Your River*" is the foundation program of the RiverSides Stewardship Alliance. *5 Things* anchors RiverSides' community-based Lot Level Pollution Prevention Strategy designed to enhance the value of municipal, non-government organization, and community nonpoint source pollution prevention efforts. One of RiverSides' primary principles, no net loss of permeability, remains an underlying principle recommended for planning and building code bylaws in municipalities throughout North America. RiverSides' program agenda focuses on establishing the lot level as the principle focus of public participation activities and the focus of public education and outreach strategies.

From 1996 through 1998, the *5 Things* campaign created a comprehensive social marketing package of practical, direct impact solutions drawn from a combination of civic and municipal programming not previously marketed or considered as "stormwater" or watershed-regeneration related. The goal was to raise the profile of nonpoint source pollution public participation through active "social change marketing" to homeowners in specific sewersheds draining to the Don River, a Lake Ontario tributary and major source river to Toronto Bay (site of a Great Lakes Water Quality Agreement Area of Concern and Remedial Action Plan). *5 Things* utilized a door-to-door social marketing canvass for 40,000 homes in five Don River neighborhoods (instead of direct education) in an effort to overcome the complexities of nonpoint source pollution awareness, which had retarded the timeline of achieving direct regeneration action.

After one year of operation, the Council of Great Lakes Governors and The Conservation Fund recognized *5 Things* as the Ontario Urban NPS Pollution Prevention Outreach and Education Success Story in 1997. In 1998, the National Capital Region of Ottawa-Carleton adopted the *5 Things* framework as the basis for its WaterLinks/CommunEAUté program to enhance the value of its surface water protection programming. Currently, the 3 Rivers Wet Weather Demonstration Program in Pittsburgh, Pennsylvania is applying a variation of the *5 Things* framework as the basis of its Nine Mile Run Watershed RainBarrel Initiative.

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History and Rationale

Until ***5 Things***, it has been standard to utilize direct education, advertising, events, and other outreach methods to communicate awareness of degraded surface waters by engaging the community in shared responsibility for watershed regeneration. This most often takes the form of getting people into the valleys, engaging them in riparian plantings, renaturalization, and other shared experience activities. To quote the goal of the City of Toronto Task Force to Bring Back The Don, these efforts aim to achieve a "clean, green, and accessible" (C-G-A) river. This approach of educating individuals or a community in order to "see and share in change" had been successfully applied for numerous years.

However successful the C-G-A events were at renaturalizing, stewarding, and watching-dogging the rivers, experience showed that individual commitment a home rarely matched the degree of commitment to and participation in the "event." There was a gap in community members' capacity to translate pollution prevention practices once out of the direct in-stream or valley application.

As a watershed community, our most dynamic example of failed community participation is in translating pollution prevention into action. We have intractable difficulty achieving leadership education and the required individual or community action to achieve not doing something that contributes to NPS degradation.

Figure 1. WaterLinks *5 Things* Brochure

Voici d'autres petits gestes que vous pouvez poser :

Les programmes ci-dessous poursuivent les objectifs de communEAUté. Appuyez-les!

Programmes régionaux

Rapportez-les : Les détaillants participants acceptent les produits usagés et les éliminent en toute sécurité. Cela comprend les produits informatiques, pharmaceutiques et de l'automobile, ainsi que les accessoires de jardin. Voir la brochure dans la trousse communEAUté!

Dépôt des déchets domestiques spéciaux : Le dépôt accepte des produits dangereux tels que des accessoires et restes de peinture, des bombes aérosol, des extincteurs d'incendie, des produits chimiques pour la piscine ou la pelouse, des aiguilles et des seringues ainsi que des produits chimiques et nettoyants pour la maison.

Collecte des feuilles et des résidus de jardin : La Région procède au compostage des résidus organiques de jardins. Voir le Calendrier de collecte des déchets pour connaître les dates de collecte. Le compost qui en résulte est vendu au dépôt sur le chemin Trail.

Programme d'assainissement de l'eau en milieu rural : Si vous avez un chalet ou une propriété rurale, renseignez-vous davantage sur la façon de protéger nos rivages et notre eau. Le Centre de ressources pour propriétaires fonciers à Manotick a de l'information pour vous! (613) 692-2390

Programme de réduction des pesticides en milieu urbain : Voir la trousse pour connaître vos options.

Pour en savoir davantage sur tous ces programmes, composez la Ligne d'information 24 heures sur 24 de la Région : 560-1335

Faites le lien!

Pour participer à d'autres initiatives environnementales communautaires, prière de communiquer avec :

Comité de l'environnement de l'Association communautaire Alta Vista : 731-4713 ou avca@altavista.net

Riverview Park Community Association : 523-1547 ou ec019@ncf.ca

Centre de ressources pour la paix et l'environnement : Centre de ressources pour les groupes d'intérêt communautaires (613) 230-4590

La Fondation Evergreen – Home Grounds - projet de naturalisation des maisons ; Learning Grounds (Programme Découvertes) – projet de naturalisation des cours d'école : www.evergreen.ca

1 DES BARILS POUR CAPTER LES EAUX DE PLUIE

Lorsque la pluie qui s'abat sur votre toit se retrouve dans l'égout des eaux pluviales, elle transporte avec elle tous les polluants qui se trouvent sur votre propriété, que ce soit les pesticides et les engrais de votre pelouse ou jardin, les détergents que vous avez utilisés pour laver votre voiture ou encore, les produits de votre automobile qui se sont déversés, comme l'huile, le liquide de refroidissement et le liquide lave-glace. Vous pouvez aider à réduire toute cette pollution dès maintenant en installant un baril pour recueillir les eaux de pluie. Ces barils présentent également l'avantage d'empêcher l'eau de s'introduire dans les drains de fondation. En plus, vous disposerez d'une source d'eau douce qui, à la bonne température, sera idéale pour vos jardins et votre pelouse. Le programme **communEAUté** peut vous offrir un baril d'eaux de pluie, un socle de béton ainsi que les directives à suivre - il vous suffira de payer des frais minimaux.

2 NATURALISEZ VOTRE PROPRIÉTÉ

communEAUté a besoin de votre aide pour créer une voûte de verdure en milieu urbain en plantant des arbres et des arbustes. Chaque arbre parvenue à maturité absorbe plusieurs centaines de litres d'eau. Ses feuilles interceptent l'eau de pluie, exhalent la vapeur d'eau et libèrent par voie de la photosynthèse de l'oxygène, contribuant ainsi à assurer l'équilibre écologique de la ville. Les arbres servent également de brise-vent et de filtre solaire, en plus d'être agréables à l'oeil et à l'oreille.

RÉDUISEZ LA SUPERFICIE DE VOTRE PELOUSE

Pour l'écosystème urbain, la pelouse vaut mieux que le pavé, mais les jardins naturalisés, c'est encore mieux! Songez à remplacer la totalité ou une partie de votre pelouse par une aire où pousseront les plantes indigènes.

3 ÉLIMINEZ TOUT DANGER À LA MAISON ET DANS VOTRE JARDIN

Votre trousse d'information **communEAUté** renferme un échantillon d'un produit sans risque pour l'environnement, mais il existe une foule de produits semblables. À l'intérieur, vous pourriez utiliser sans danger des produits de remplacement efficaces au lieu des produits chimiques pour la maison, dont bon nombre ne peuvent être éliminés de l'eau par le biais du traitement des eaux d'égout. À l'extérieur, évitez de vous servir pour votre pelouse de produits dangereux comme les pesticides et les engrais qui se retrouvent dans les égouts d'eaux de pluie pour finalement aboutir dans la rivière. Votre voiture a besoin d'être lavée? Vous pouvez aider à garder nos rivières propres en vous rendant dans un lave-auto car l'eau de lavage est alors acheminée vers la station de traitement des eaux d'égout.

RAMASSEZ LES EXCRÉMENTS DE VOTRE CHIEN

Que vous promeniez votre chien dans la Ceinture de verdure ou autour de la maison, il est important pour l'environnement de ramasser les « petits cadeaux » de votre chien et de vous en débarrasser dans la cuvette de la toilette.

4 ÉCONOMISEZ L'EAU

Moins vous utilisez d'eau à la maison et dans votre jardin, moins l'impact sur l'environnement naturel sera grand. La trousse **communEAUté** renferme des outils pour vous aider à économiser l'eau à l'intérieur et à l'extérieur, y compris des aérateurs de robinet, une pomme de douche, une minuterie pour le tuyau d'arrosage ainsi qu'un indicateur de niveau d'eau qui vous fait savoir à quel moment vous devriez cesser d'arroser, en plus d'un coupon pour obtenir d'autres accessoires permettant d'économiser l'eau. Ensemble, nous pouvons changer bien des choses!

5 À VOUS DE JOUER!

communEAUté vous rappelle que tous vos gestes ont un impact sur l'environnement. Pour un écosystème sain, tout commence chez soi! **Si vous mettez en pratique les cinq mesures du programme communEAUté, c'est tout votre entourage qui en retirera des bienfaits : votre maison, votre quartier, en plus de nos rivières et de nos lacs.** Appuyez donc le programme communEAUté en faisant partie du comité de l'environnement de votre collectivité, en encourageant d'autres personnes à s'engager et en appuyant activement la préservation de la qualité de l'eau et de l'écosystème dans notre milieu urbain. Faites le lien!

1
2
3
4
5

Every day,
household habits contaminate our neighbourhood rivers.
If you could make a positive difference,
would you?

Discover the power of
5
Things You Can Do to Safeguard Our Water

WATERLINKS COMMUNEAUTÉ
Ottawa-Carleton

WaterLinks

WaterLinks is a Region of Ottawa-Carleton water quality initiative. The project was developed in partnership with the City of Ottawa, communities of Alta Vista and Riverview Park, environmental organizations, members of the public and government agencies.

Find out more: Call 560-6086 ext. 3292 or visit www.rmoc.on.ca

May 2000

RiverSides designed ***5 Things You Can Do For Your River*** as a framework program that identified the impact of NPS degradation. The program provided householders in sewersheds whose runoff and overflows were directly responsible for that NPS degradation a solution-based opportunity to participate in watershed recovery. By revising the traditional practice of a door-to-door canvassing and linking it to social marketing methods, ***5 Things*** brought NPS Phase II directly to where watershed residents lived, not on a watershed basis, but by identifying the sewershed within which they lived and via which their pollutant loading were being directly discharged into the river.

Using the motto, *Your Home—Your River: Make the Connection,* ***5 Things*** formed the question in the minds of residents, "How does my water make it to the river?" and attempted to fill in the missing link in their knowledge. Many of those reached by the canvass made an immediate realization of the connection between their property lot level and the health of their local river. To bolster that knowledge into action, ***5 Things*** delivered five programs, each with an incentive package that, when implemented, made an immediate and significant improvement on the health of the watershed via sewer system improvements.

The ***5 Things*** campaign asked householder to undertake five action related measures:

- **Disconnect**: your downspouts and install a rain barrel.
- **Clean**: commit to a toxic free home and yard.
- **Conserve**: water everywhere.
- **Create**: natural water filters and soft surfaces to allow rain to drain into the soil and reduce sewer overflows into the Don.
- **Call**: RiverSides to arrange for a free EnerGuide For Homes Visit.

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Each action reflected an existing civic or municipal program. ***5 Things*** asked those householders to make a commitment by signing up for free or low cost incentives that achieved a change in their habits and a reduction in their NPS impact on the local sewer system and, by extension, the Don River.

Social Marketing Methodology

Figure 2. WaterLinks Logo

Educating the public about NPS pollution consists of linking a very complex set of variables together and associating the variables with the residents where they are the most comfortable (and hence resilient to change), at home. ***5 Things*** applies social marketing to address the barriers raised by community norms and expectations, while also providing a framework of reinforcement for the initial education outreach and implementation.

Method

The goal of social marketing is to achieve a commitment to social change. Now, of course, we don't put it in those terms. We make it a commitment to *Bring Back The Don, Save the Rouge*, or to *Live Toxic Free in '93*. Whatever—put it in terms of a commitment. Asking for that commitment is the first most important thing that a campaign can do.

It is demonstrated that a commitment, and the more public the better, is a recognized method for the householder to achieve change. They do so because they feel the power of public attention, even though that attention is self-imposed.

Therefore, ***5 Things*** focuses on giving the householder an opportunity to make a commitment to their local watershed beginning where they live. Most importantly, this commitment must be recognized, and rewarded. Methods of recognition included:

- Household static cling decal, for the window or the door,
- Lawn signs,
- Notices in a newsletter,
- Plaques, or
- Advertisements in the community newspaper.

The more public the recognition, the more likely it is to achieve a groundswell of support. However, getting the commitment and the right to use a person's name as support for the program is not as easy as simply as asking for it. It is the municipality's objective to build a partnership with an NGO to sponsor the delivery of a ***5 Things*** clean water framework program. Every water quality canvass elicits a RiverSafe commitment to NPS pollution prevention from residents in a specific sewershed.

Stage One: Data Gap Analysis

Before you take to the streets though, it is imperative to put a poll in the field. Most polling can be integrated into existing polling processes, or made a stand-alone introduction to the program. No matter how limited or broad in scope, a poll can help you find the pulse of a community. What do they know about that you consider being the most important thing since sliced bread? Don't be dismayed. A poll reflecting a few results that no body cares, wants to do anything, or spend any money, is normal. After all you're the new kid on the block. You've got to earn your street credentials or at least some form of legitimacy.

In some respects, you can identify with a positive or a negative element that you are building your campaign around. If saving the river is a non-starter because, for example, shutting down of the old mills has made it cleaner, take advantage of that to highlight the comparison between point and non-point pollution loadings.

The poll can be directed to the watershed you wish to cover, or a general poll to tally the whole city. Either way, it is important that you use directed questions to establish the role of the individual in the equation of making clean water or lot level solutions.

You may want to know if a free rain barrel is what they need, or would they be interested in a rain barrel as a stopgap to the inevitable tax of the utility? Do you get a warm and fuzzy reply to questions suggesting you'll clean up the river only with their help? Or does their fury of yet another inevitable tax increase bounce back on you regardless of what you propose?

Here we're not looking for answers, so much as just an understanding of the lay of the land. We have our approach and we have our goals. The poll just lets you know what to expect.

Sewershed Mapping

Sewershed mapping of the physical area drained to a specific outfall is a powerful method of illustrating to the community where its rain flows, as well as the fate of buried streams, overflow points, and weirs. One of the most powerful elements of the ***5 Things*** campaign is the mapping of the sewershed and the delivery of the canvass on a subsewershed basis. The application of the canvass on a sewershed basis makes a direct connection to the householder that this is where they live, and the rain and their sewer overflows wind up in a particular point on the river.

Stage Two: The Canvass Outreach and Implementation

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The Water Quality Canvass is where the rubber hits the road on public outreach. ***5 Things*** uses a two-team approach consisting of four canvassers working in units of two per street.

The canvass covers the neighborhood in a three-sweep approach: distribution of doorknockers, direct household canvass sign up, and delivery/implementation and follow-up. Each sweep covers a section of streets that has been mapped.

The teams engage householders to participate in bringing back the local river by means of committing to one or all of the five programs. This introduction is inevitably met with a question about how much, for what, for whom, how, or any other. The response that this is an information and outreach canvass inevitably is met with a dualist response of "nothing is for free" or "that's great, where do I sign?" At the point when the householder accepts the offer, the canvasser does a lot level assessment to determine the permeability coefficient of the lot, the best place for a rain barrel, a tree and other enhancements, and asks a few simple questions of the homeowner and his/her habits.

The canvass process requires considerable funding, but there are a number of opportunities to establish a summer season or full year around staff through AmeriCorps and other training avenues. The benefit of using this approach is that staff often are insured through a third party. This keeps the watershed group from carrying its own insurance for summer staff.

Stage Three: Reinforcement and Enhancement

The success of the ***5 Things*** framework lies in its ability to deliver a range of issues and programs. It is a framework that surmounts barriers to wet weather NPS Phase II that exist for the following reasons: NPS information is complicated, it overlaps so many other areas of jurisdiction and interest, and it relates to the property owners, few of whom have made a commitment to watershed health.

Figure 3. Stage 1 Canvass Door Knocker

5 Things also demonstrates that to make progress on NPS Phase II we must provide the means by which the public and individual can participate in the process. Education alone is not going to get us anything other than a literate community. As studies on energy retrofits have shown, giving out the means itself is also not enough. The benefit comes in the integrated social change and recognition that shift individual habits to Phase II standards.

To maintain the benefits achieved through the canvass, follow-up and reinforcement are very important. The first form of reinforcement is to use the final canvass sweep to recognize those individuals who adopted the initial offering on the first sweep. Door drop thank you forms encourage them to bring neighbors into the process. Other forms address people who did not take up actions and those who were absent throughout the canvass. Each card offers the ability to participate at any time either in person or on-line.

The reinforcement of the process takes place when the rain barrels or other incentives are installed. This gives the canvass members an opportunity to applaud the choice of the homeowner and to seek other improvements in their practices.

Decals, fridge magnets, follow-up newsletters, and other forms of communication are important in keeping the householder informed and reinforced.

Water In the City Walk

An offshoot of the sewershed mapping process, the *Water in the City Walk* (WITC) provides a public education walking tour element to the ***5 Things*** framework. It imparts a practical, enjoyable, and hands-on (feet-on) approach to understanding the link between the neighborhood, the sewershed, and how our daily actions, urban design, and municipal maintenance affect water quality. The tour follows the path of a raindrop from where it falls in the community to where it joins the river via the sewer system.

WITC is traditionally delivered as a guided tour, but can also be designed as a self-guided audio tour. You can utilize the sewershed mapping to build a Water in the City walk as a direct education adjunct to the canvass.

Conclusion

The conclusion to a ***5 Things*** campaign is that it establishes a strong platform upon which to build long lasting relationships with the householder. The goal of effective social marketing is not to achieve a "one time sale," but to build a relationship with the householder so that they feel engaged and appreciated as the source of clean water programming.

Please contact the RiverSides Stewardship Alliance for more information on ***5 Things Your Can Do For Your River*** and other enhancement programs.

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The Outreach Continuum: Moving Participants from Information to Action

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Abstract

Many outreach programs use similar strategies—information, education, and technical assistance—offered in hopes of encouraging individuals to implement Best Management Practices (BMPs) and become active water resource stewards. In evaluating our programs, it is relatively easy to measure "outgoing efforts" such as programs offered, numbers of participants, or materials distributed. But many of us really do not know if our programs and services are having the desired effect. By better assessing audience information and using it to customize and integrate our programs, we should be able to encourage (and track) individuals as they move through the "Outreach Continuum"—progressing from awareness to implementation.

As program managers, assessments like this can be useful in structuring programs and guiding resource investment whether in printed materials, Web site development, advertising campaigns, school programs, adult education, direct assistance, or incentives. With funding from the Washington State Department of Ecology Centennial Clean Water Fund, Snohomish County, Washington's Surface Water Management Division (SWM) had the opportunity to assess one such approach. Our goal was to achieve BMP implementation by targeted residents through the development, implementation, and evaluation of a full-spectrum outreach strategy. Components of the project included market data compilation, targeted audience development, program packaging, a wide spectrum of services, evaluation, and follow-up.

Recognizing the cumulative impact of individual actions, our ongoing goal is to motivate beneficial changes in personal behavior patterns and the thousands of everyday decisions made by streamside residents. Our success depends on detailed knowledge of our "public," (e.g., their needs, motivational factors, barriers) as well as how our programs affect them. Information gained from this project has resulted in better service integration, a transferable method for program development, and a more focused approach to program evaluation.

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Introduction

Encouraging individuals to become active water resource stewards, voluntarily implementing Best Management Practices (BMPs) in their daily activities, is one of the key objectives for nonpoint pollution reduction. Agencies and organizations use a range of standard information and education strategies to foster this behavior change. To maximize the effect of outreach programs, it is important to determine how our various strategies relate to one another, focus them around an action goal, and integrate elements of our approach. A program targeting a narrow audience segment with potential to show direct results provides an appealing alternative to a more broad-spectrum approach.

Snohomish County Washington is a NPDES (National Pollutant Discharge Elimination System) Phase I jurisdiction, covering 2,089 sq. miles with a population of approximately 622,000. The Surface Water Management Division of Public Works administers the county's NPDES permit as part of its three-part mission: water quality, water quantity (flooding and drainage), and aquatic habitat. Outreach services are fairly comprehensive, including public information services, youth and adult education programs, technical assistance to property owners, volunteer opportunities, and restoration projects. In an effort to refine our overall approach, we developed a conceptual model and pilot program that capitalized on the inter-relationship of outreach services and their effects.

The Outreach Continuum

Although other educational models exist, including the well-known Bennett's Hierarchy (Bennett, 1975), we wanted to create a simple conceptual model that would illustrate how our programs and their impacts were linked—from both our perspective and our audience's (see Figure 1). Our assumption is that program elements relate to and build upon one another, and improved understanding of this relationship will help us better achieve desired outcomes. For instance, before individuals get to the "Action," or "Applied Learning" level, they must first pass through the "Awareness" and "Knowledge" levels. Individuals may achieve this progression using information from various sources over different periods of time. Some may progress quickly, while others may take years or stop at some level. Figure 2 shows examples of indicators that can be used to judge an individual's progression through the continuum. Figure 3 illustrates how our particular program elements relate to this continuum.

Figure 1.

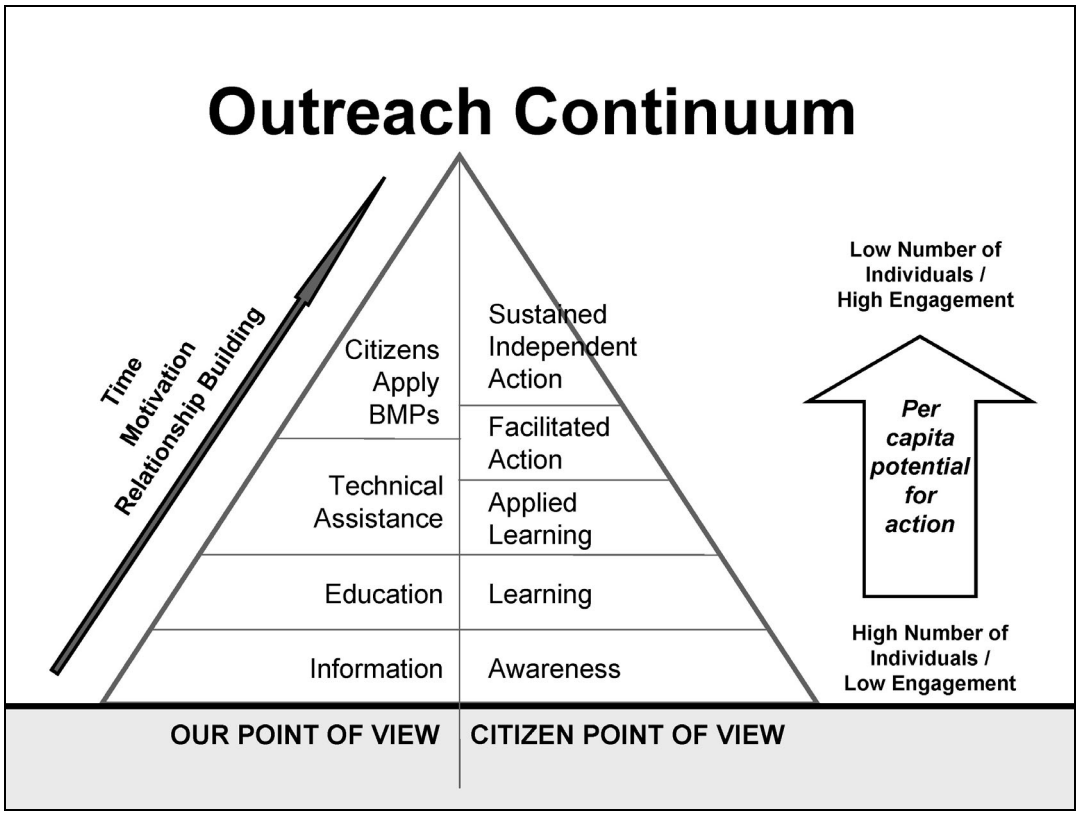

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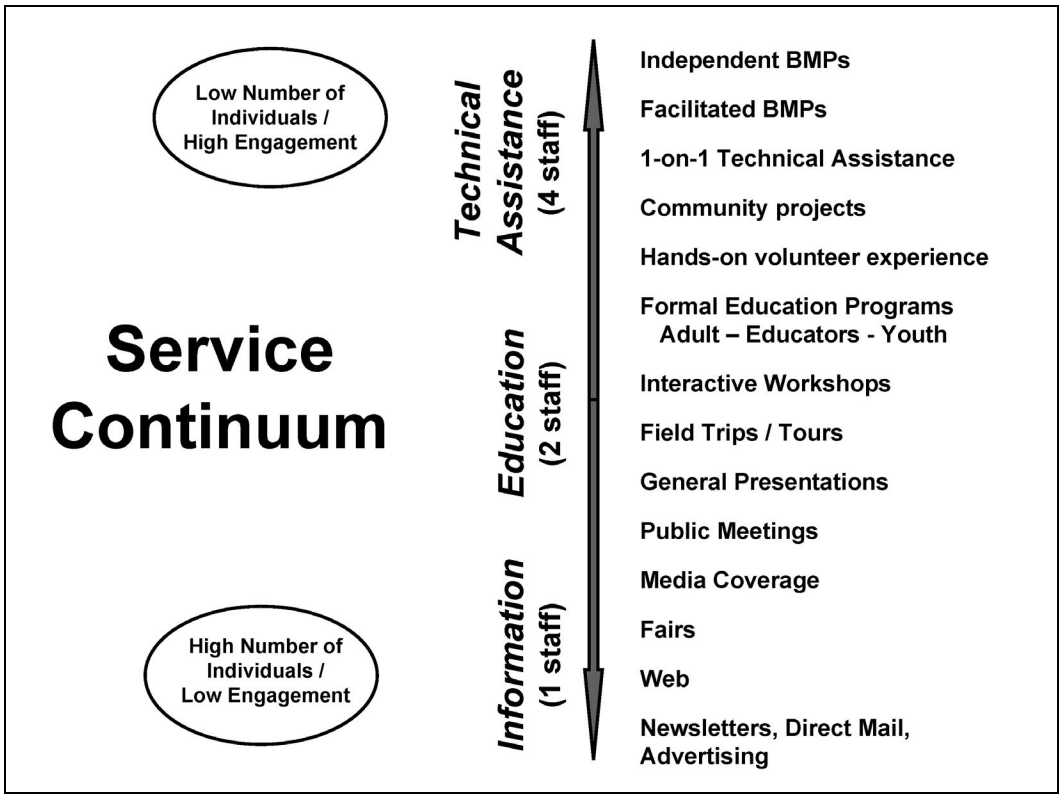
Figure 2.

Our Point of View	Citizen Point of View	Indicators
Citizens Apply BMPs	*Sustained Independent Action*	Actions are informed and personally motivated Sustains stewardship activities Sustains BMP's at home Leads community stewardship activities Meets most indicators below ↓
	Facilitated Action	Participates in community stewardship activities Participates in community affairs Communicates BMPs to others Networks within community Hosts a stewardship activity Meets most indicators below ↓
Technical Assistance	*Applied Learning*	Solicits technical assistance Focuses on specific issues Tries BMPs at home Participates in continuing education or multi-session classes Meets most indicators below ↓
Education	*Learning*	Participates in education programs Attends field trips and tours Participates in short workshops and classes Attends public meetings Meets most indicators below ↓
Information	*Awareness*	Attends presentations Visits web site Receives information at community events Receives media Receives direct mail

Figure 3.



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As the model shows, we can expect to reach large numbers of people at the lower stages of contact, but the average person reached may be unlikely to act on what they have seen, read, or heard. This could be described as an "engagement factor," which reflects their motivation, understanding, and willingness to learn or do more. At any particular continuum level, the engagement factor provides an indicator of per capita potential for action. As individuals progress to the "Education/Knowledge" level, they begin to internalize the information and the information is more likely to influence their actions. We have found that by going even further in the "Applied Learning" phase and providing customized technical assistance and hands-on experience, individuals are much more likely to attempt a behavioral change. If these actions occur with a solid foundation of knowledge they have a higher likelihood of being sustained and expanded.

Interestingly, the staffing of our particular program is inversely proportional to this pyramid—with twice as many staff in the technical assistance category (four people) than education (two people), and twice as many education staff as informational (one person). This illustrates that, for our program at least, although we deal with far fewer people toward the top of the continuum, the efforts are much more intensive and require more time per individual.

As a conceptual model, the continuum describes general trends. Individuals may come and go from continuum levels and may have unique progression tracks influenced not only by our programs, but a range of external factors, messages, motivations, and issues.

Applying the Model

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We believe by focusing a sustained engagement effort (information, education, then customized technical assistance and incentives) on a narrow audience segment we can achieve better traction in moving individuals up the continuum to the action phase. Using a grant-funded pilot program, we had the opportunity to apply the model, evaluate factors that encouraged actions, and track how individuals progressed from the "Information and Awareness" stage to voluntary BMP implementation. The pilot program and our resulting experience have helped us refine the continuum model and use it in managing other programs.

We adopted a three-phase approach to the pilot program:

1) Identify target audience(s) and desired outcome.
2) Use research findings to develop format, content, and services.
3) Provide an integrated service approach to engage the entire continuum.

1. Target audience and outcomes

Initial audience research indicated that 52% of our public was "ready and willing" to do more to protect streams. Our greatest potential was in reaching folks who had a reason to both 1) care about water quality, and 2) the belief that their actions could make a difference.

Our desired organizational outcome was BMP implementation by landowners, particularly those who could have a significant impact on local surface waters. Potential actions included a suite of actions, such as use of native plants, revegetation, invasive weed control, runoff reduction, lawn size reduction, improved landscaping practices, reduced household and garden chemical use, etc.

Our audience assessment and outcome goals converged easily into a target audience of streamside landowners within our service area, which included approximately 16,000 individuals. In addition, our research explored promising demographic subsets of this audience. We are currently assessing whether we can increase our per capita potential for action by narrowing our target audience based on other key indicators (e.g. women with children, advanced degrees, recreational interests, or frequent voters). With the completion of this phase, we will evaluate differences between a highly refined target audience and a broader marketing approach.

The target audience and demographic subsets in our pilot program were reached using internal Geographic Information System (GIS) data, county assessor and auditor data, and purchased mailing lists.

2. Program development - format, content and services

Using a phone survey, focus groups, and feedback from previous landowner contacts, we refined our messages, delivery system, and a marketable set of topic and service offerings. Our goal was to appeal to the values and issues faced by this target group, maintain our core messages, build trust and brand recognition of our organization as a service provider, and at each stage of the program deliver the information and motivation necessary for our audience to move into the next continuum level.

Research highlights used in program development

Awareness & interest levels:

- 52% of residents were considered "Ready and Willing" to reduce their impacts, 13% "Persuadable" and 35% "Unwilling."
- "Ready and Willing" residents tended to be parents, young women, non-college educated women and/or young residents, self-identified urban and small town residents.
- Polluted runoff, illegal dumping, and effects of development are commonly recognized environmental threats.
- Over 70% of residents knew ways to reduce their household impact and were interested in learning more and doing more.

Issues affecting motivation:

- Roadblocks to learning more: not knowing where to get information, unwillingness to seek it out on their own, general distrust of government for assistance.
- Roadblocks to doing more: time constraints, lack of information, and perception that they could not make a significant impact.
- Stewardship for future generations and children's health were compelling motivators.
- Perception that government provides too much regulatory leniency to developers is a serious demotivator for citizens.
- Gender differences exist in willingness to employ some BMPs.

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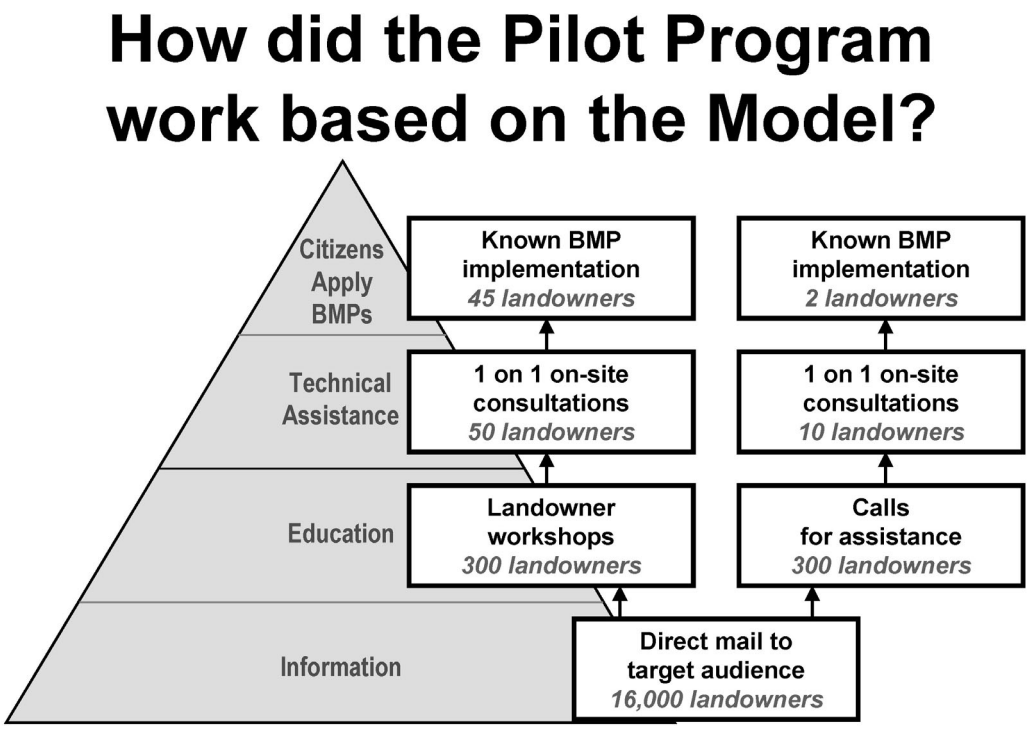
3. Integrate service provision

For the pilot program we developed and implemented a "full continuum" program, offering information, then education, and finally technical assistance targeted toward the selected audience. Having defined messages, content, and services through survey and focus group research, we began with direct mail to all streamside homeowners within our service area. (Demographic subsets of this audience received an additional series of informational mailings intended to build name recognition and progressive exposure to BMPs). The target audience was then offered a series of workshops related to streamside living. Slightly different workshop themes were used to attract different audience interest groups. Finally, staff consultations were made available to workshop alumni. The consultations involved individual site visits, evaluation, and recommendations of appropriate BMPs and resources. The program is illustrated in Figure 4.

Figure 4.



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To facilitate moving the target audience up the continuum, we provided clear direction on next steps, motivational messages, audience-focused content, and resources to make personal changes less intimidating—including group dialog, hands-on experience, cost-share incentives, and personalized assistance. We focused on a narrow audience with defined outcomes, repeated exposure to messages, and increasingly personalized approaches to achieve desired traction in the upward progression. Our evaluation of the program included 1) how well the participants progressed in the continuum, 2) how successful the program was in achieving actions, and 3) standard program/service feedback.

Participants, most of whom were new contacts for us, were in general highly satisfied and enthusiastic about our program. As a result of the program, nearly all expressed a more "watershed friendly" perspective and had implemented BMPs ranging from small measures to extensive revegetation projects on their properties. Secondary benefits of the program include enhanced information dissemination (alumni sharing information with neighbors and friends) and residual potential in target audience as a result of our contact (for instance: mail recipients who might yet attend a workshop or seek additional information, future consultation requests from workshop attendees, increased organizational name recognition, evolving awareness and increased sensitivity to BMPs, etc.).

Conclusions

Behavior represented on the continuum results from a variety of motivations and influencing factors, unique to each individual. Predictably, as individuals moved up the continuum, we saw greater potential for behavioral changes, more consistent indicators, and more per capita actions. Individuals with increased knowledge and skill levels were more likely to sustain their new actions. We were pleased with the high percentage of individuals that moved from the "Learning" through "Applied Learning" to

the "Action" phase. In our opinion, using an integrated programmatic emphasis on a particular audience helped us better achieve continuum progression, and we were able to see a direct correlation between our contact and resulting behavior changes.

The target approach applied in this pilot program has helped us refine our evaluation; be more realistic in our expectations and performance measures; better target our programs, staff, and financial resources; and demonstrate direct value for public investment. In addition, we have recognized many beneficial byproducts, including the ability to attract non-traditional audiences by choice of topic, opportunities to measure direct impacts resulting from our contact, greater understanding of subtleties in message and language, and increased potential for building community watershed stakeholders. Overall, we felt the pilot program was highly successful and extremely well received by participants, and we will continue to use it (in our mix of offerings) as a model for target program development. We do not expect it to replace broader-based strategies (both in audience and content), however, the pilot program serves an important and inclusive role in achieving NPS pollution goals.

What's next for us? Our short-term plans include test-driving the model with other programs (different goals, different audiences), addressing specific motivating factors to increase likelihood of success, and continuing to improve our evaluation process. Specifically, this includes:

- Completing the implementation and evaluation phase of the market research, including continued trials of demographic subsets to see if we can narrow our initial audience for this or future programs.
- Adding elements, such as better BMP "marketing" materials and an incentive program at the technical assistance stage, to see what impact that has on initial and sustained behaviors.
- Developing a new focus program that targets subdivision residents with urban watershed issues.
- Refining evaluation measures, e.g. attitude and behavior change, value of square footage restored, watershed improvement data related to individual BMPs, return on investment, and others.

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Lessons Learned: Top 5 Recommendations

1) TARGET. Good targets lead to good results; don't waste seeds by planting them in infertile soil.
2) MESSAGE & MOTIVATION. Get their attention, provide information they want, maintain core theme (even if you have to wrap it in something else), overcome demotivators, and focus on audience values (trust, time, financial impacts, family, peer pressure, and tangible outcomes).
3) KEEP THE GOAL IN MIND. Action, action, action; recognize the value of your results and find a way to measure it.
4) BUILD TRACTION. Visualize the continuum from both the program and receiver perspective. Integrate your strategies to help participants move to the next level.
5) EVALUATE & ADAPT before, during, and after. Everything is a dynamic process, and you can always find ways to improve.

References

Bennett, C. 1975. Up the hierarchy. Journal of Extension, 13(2): 7-12.

For more information about Bennett's Hierarchy, you can also visit the Web site:
<http://deal.unl.edu/TOP/english/index.html>

Building an Environmental Education Collaborative in Your Community

Margit Brazda Poirier
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Abstract

Is it hard to coordinate environmental education efforts in your community? Find out how to build an environmental education "collaborative" of formal and informal educators without the hassle of developing a new nonprofit agency. We will use the model of the Water Education Collaborative that works to educate and involve citizens in water quality protection of the Great Lakes. You will walk away with practical tools to set up a collaborative in your community.

Many communities have an abundance of resources and organizations committed to environmental education, but no means by which these groups can partner together efficiently and effectively. In this session, I will present a step-by-step process by which conference attendees can create an education collaborative in their own communities and share some of the successes and "bumps in the road" that we have encountered. Emphasis will also be placed on long-term success after the initial start-up phase.

I will use the model of the Water Education Collaborative (WEC) in Rochester, New York. The WEC is a coalition of 18 public and private organizations that work together to educate and involve citizens in water quality protection of Lake Ontario and its watershed. While the collaborative is not a nonprofit agency, it does enjoy nonprofit status via a "host agency," the Rochester Museum & Science Center. Because of this unique partnership with the museum and our collaborative structure, we have been able to: 1) expand and improve upon environmental education efforts in the community and create new programs where needed, 2) leverage funding that would not have been available to any single agency, and 3) serve as a resource/clearinghouse for water quality education. In 2002, the WEC reached over 15,000 youth and adults through education programs and received several grants.

Conference participants will learn practical tools to set up a collaborative in their own community and ensure its long-term success.

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Introduction

Many communities have an abundance of resources and organizations committed to environmental education, but no means by which these groups can partner together efficiently and effectively. This manuscript describes a five-step process that can be used to create an education collaborative in your own community, using the Water Education Collaborative (WEC) as a model. Emphasis will also be placed on long-term success after the initial start-up phase.

Background

The Great Lakes hold about 20% of the world's fresh water and are constantly threatened by water pollution from various sources. Locally, Lake Ontario, the Genesee River, and most of the region's streams and ponds suffer from water pollution. A bi-national board, the International Joint Commission, selected Rochester, New York as a local "Area of Concern" that needed a plan to address water quality problems. That plan led to the formation of the WEC in 2001 to address threats to water quality through community education and action. The WEC was formed after years of research indicated that most of the threats to water quality come from polluted runoff and sources that ordinary citizens can help

control, such as lawn and farm chemicals, leaky septic systems, soil erosion, storm drain dumping, and others.

The Water Education Collaborative

The Water Education Collaborative (WEC) in Rochester, New York serves as the case study for this report. The WEC is a coalition of 18 public and private organizations that work together to **educate and involve citizens in water quality protection of Lake Ontario and the Genesee River watersheds**. While the WEC is not a nonprofit agency, it does enjoy nonprofit status via a "host agency," the Rochester Museum & Science Center. Because of this unique partnership with the museum and our collaborative structure, we have been able to: 1) expand and improve upon environmental education efforts in the community and create new programs where needed, 2) leverage funding that would not have been available to any single agency, and 3) serve as a resource/clearinghouse for water quality education. The above three-fold purpose has been critical in establishing our identity as a group. Likewise, it is important to be clear about what we do not do, i.e., lobby for legislation and regulation.

The **mission** of the WEC is to focus the combined resources of member organizations to provide water quality education services to the public within the Genesee Region watersheds. The WEC was formed in April 2001, but the planning for this collaborative began over a year prior. The full collaborative meets six times a year. Several sub-group meetings focus on specific projects or business items. Also, an annual five-hour retreat is held each winter for more significant internal organizational work.

One full-time director, a full-time volunteer programs coordinator, and a part-time program assistant staff the WEC. Our funding for 2003 came from a variety of sources: 51% public funds (county), 32% local foundations and professional societies, 11% state and federal grants, and 6% corporate grants and sponsorship. Future plans include establishing a dues-paying membership campaign and charging fees for services (for example, helping municipalities meet the U.S. EPA's Phase II Stormwater Rule public education and citizen involvement requirements).

Because this report focuses on the "how to" aspect of building a collaborative, there will not be much emphasis placed on the many water quality education programs and events that result from the WEC. Successful programs include an annual coastal clean-up, Community Water Watch (a citizen stream-monitoring effort), Great Lawns/Great Lakes (a program for homeowners to reduce lawn chemical usage), a new partnership with a local television and newspaper meteorologist, teacher training programs, and dozens of community events. The most important point about our education programs is that they are structured to meet the state's science standards for K-12, an essential element of involving youth and teachers.

Please visit the WEC Web site <http://www.thewec.org/> to learn about these programs and more.

Why build a collaborative?

There are many reasons why we chose to form a collective group, called a "collaborative," instead of developing a new not-for-profit (nonprofit) agency that would focus on water quality education programs. The reasons we chose the former option are that collaboratives:

- Are effective for leveraging resources,
- Are appealing to funders,
- Save time by avoiding the legal/paperwork requirements of forming a new nonprofit,
- Build on existing resources,
- Encourage new links/networks in the community,

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- Avoid saturating the community with yet another nonprofit group, and
- Have worked well in the social service sector and have a positive public perception.

Of course, there are some disadvantages to this approach as well, including:

- The difficulty involved in establishing a clear identity (at first),
- The concerns of existing organizations losing their identity if they join in, and
- The collaborative process can be very time-consuming for board members and staff.

The "leveraging of resources" is perhaps the single most significant benefit to offset the time it takes to organize and coordinate a collaborative. Within this structure, people can unite for a common goal and share expertise, volunteers, publicity, and funding resources. In the case of the WEC, some of the benefits have included more press coverage for events and programs, greater success with grant seeking, and more volunteer involvement in education programs. In addition, there is less duplication of effort when organizations work together and greater success of programs and events.

How to Build a Collaborative

Step 1: Form a Planning Committee

The first step to initiating a successful collaborative group is careful planning. Approximately one year before members were officially invited to serve on the WEC, a planning committee was formed. This committee consisted of representatives from local groups that had a strong interest in educating and involving citizens in water quality protection, and these representatives eventually became board members of the WEC. The work of the planning committee can consist of several key items, depending on the comfort level of the group in making certain decisions before a full collaborative is formed. It is challenging, but essential, to balance the importance of making certain decisions as a small planning group versus the benefits gained from having the collaborative develop its own aspects of functioning once established.

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Therefore, the planning committee tackled the following tasks prior to the formation of the collaborative:

- Bylaws were established which stated the purpose of the collaborative, meeting frequency, size range of group (10 to 30 members), supervision of executive director, board member expectations, voting, etc.,
- Several standing committees were established including an executive committee to handle business tasks, a personnel committee to supervise and guide the executive director, a revenue committee to focus on financial stability, and a media/communications group, and
- A detailed job description for executive director was written and hiring took place.

Step 2: Select a "Host"

As mentioned earlier, collaboratives are not 501(c)3 nonprofit organizations and therefore need a "host" through which to conduct fundraising, accept grants, and provide administrative support (office space, overhead, etc.). The careful selection of a host agency is critical to ensuring long-term success.

The planning committee listed specific criteria it could use to select a host, after which they issued a community-wide request for proposals from local nonprofits. The applicant organization was evaluated based on several criteria including: stability and reputation, mission (is it in line with yours?), leadership capacity, neutrality, access to funding, and administrative capability. The planning committee reviewed applications, conducted interviews, and selected the Rochester Museum & Science Center, after which a contractual agreement was executed.

Step 3: Solicit and Appoint Board Members

The WEC board differs from typical nonprofit boards because its members are organizations, not individuals. For the sake of clarification, the board members constitute the collaborative. Each member organization appoints one representative to serve on the board. This ensures that when there is a personal retirement or job change, the actual membership of the board does not change. One disadvantage to this approach is the difficulty in equitable grant seeking and funding programs. Most nonprofit boards have individuals who are willing to conduct fundraising on behalf of the organization. However, many of the WEC board members are nonprofit organizations with their own budgetary woes, and cannot justify fundraising for the WEC and its collaborative programs. Early on, this became an important issue for the WEC. Since then, the collaborative has made great strides in balancing competitive funding needs and creating win-win situations.

Helpful advice for forming a board:

1) All invited participants should support the common goal/purpose,
2) Consider establishing a maximum group size,
3) Attempt to gather members that offer diversity in professional and organizational expertise, as well as bring a geographical diversity, and
4) Clearly state expectations of the board and benefits to members.

Some of the benefits to the WEC board members include:

- A support network of water quality professionals,
- Leverage grant funding for water quality education programs,
- Increased publicity for the member organization and its programs,
- Up-to-date information on water quality and education programs, and
- Name recognition for the member's organization and the WEC.

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Step 4: Building Group Cohesion

There are far more resources and theories for team-building skills and developing cohesion in a group than can be addressed here. However, there are some techniques that have worked particularly well for the WEC.

Board meetings are structured with an agenda that is based on members' needs and interests. Meetings start and end on time and unfinished business is often addressed at executive committee meetings or project work groups. The annual retreat is extremely helpful for delving into organizational issues, and has been demanded now by the members. It is helpful to have a facilitator that is neither affiliated with the board nor a staff person to the collaborative.

In order for a group to be cohesive, it must have a clear mission and purpose. This should not be taken for granted, and should be revisited at every meeting or gathering. It is helpful to seek organizational help with big issues early on in the process. There are many organizations that offer free or low-cost assistance to nonprofits to help develop mission, identity, main message, marketing and communication skills, and fundraising strategies.

Step 5: Strengthen for the Long-Term

The WEC has only been active since April 2001, but already we have learned the importance of all the hard organizational work that took place in the first year (developing mission, purpose, a funding strategy, and even deciding how we make decisions!). So, how do we ensure our success in the long term?

Keeping an active board is imperative, and this means lots of hard work for the staff. Strive to keep all members involved, not just the active few. Forming work groups to encourage organizations to work

together on interesting projects that generate measurable results is effective. We are creating new education programs and are forming new partnerships that will lead to even greater citizen involvement. This helps keep board member interest and enthusiasm high and helps the WEC fulfill its mission. Consequently, expand and publicize the existing successful outreach programs.

Staff can encourage frequent social, as well as professional interactions among and between board members: Coffee before work? A light dinner/snacks after a board meeting? A visit to one of the many environmental resources you are helping to protect?

And lastly, a key to ensuring long-term success of your collaborative is evaluation. And then, more evaluation! The WEC spent its last retreat focusing on evaluating its own effectiveness by asking questions, such as: What is better because of the WEC? How do we know we're making a difference? How do we articulate our value in the community? An internal board member survey will be administered this fall, and the results discussed at the next winter retreat. The sample survey is shown below.

Draft WEC Board Member Survey Questions:

1. What is your organization's role/involvement in water quality education?
2. Has your involvement in the WEC affected your organization's role in water quality education? Y/N, describe.
3. Here are several goals/purposes of the WEC. Please rate them in importance from 1 (not important) to 5 (extremely important).
   - ___ Help members obtain grants to support water quality education
   - ___ Assist with, and support existing educational programming
   - ___ Develop new educational programming
   - ___ Provide a forum for communication among organizations involved in water quality education
   - ___ Serve as a technical resource and clearinghouse for water quality information
4. Rate the effectiveness of the WEC with regards to these goals/purposes (1=not effective, 5=very effective).
   - ___ Help members obtain grants to support water quality education
   - ___ Assist with, and support existing educational programming
   - ___ Develop new educational programming
   - ___ Provide a forum for communication among organizations involved in water quality education
   - ___ Serve as a technical resource and clearinghouse for water quality information
5. Why is your institution/organization a member of the WEC Board?
6. Why do you personally participate in the WEC?
7. What is the Collaborative's greatest strength?
8. What is the Collaborative's greatest weakness?
9. What would you suggest to address #8?
10. MAYBE: Would your organization be willing to pay dues to be a WEC member?
11. List other organizations you believe would be beneficial and actively contributing board members.

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Conclusion: Challenges that Remain

The collaborative organization is always changing. Therefore, it is important to be aware of new issues that are emerging and different ways of working together. The WEC has achieved a great deal of success thus far, and is well positioned to continue this trend. Current challenges that remain include:

Name Recognition

Many more people know the name, Water Education Collaborative, than did a year ago. We assume this is largely a result of media attention to our programs, a new Web site, and our presence at hundreds of school and events. However, there is still a need for more name recognition that helps to attract citizen involvement and sometimes, funding.

Collaborative Identity
It is important to continuously foster a sense of ownership among the group. There is no WEC without the individual contributions of each member organization.

Articulating Success
Progress in water quality improvement and citizen involvement needs to be shared with the greater community more often.

Funding Stream
The challenge of continuous funding for staff and new programs remains.

Expanding Geographically
The benefits of expanding into more regions of the watershed and outside of it speak for themselves, but how do we do it? With what resources?

These are the issues the Water Education Collaborative will address now and into the future. In summary, there are many ways to establish and maintain a thriving collaborative group. This is one method that will hopefully be helpful to other communities.

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RiverSmart: Public Education through Grassroots Communications

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Abstract

For the past 15 years, River Network has supported a growing grassroots movement of river and watershed conservationists nationwide. Today, we recognize that the lack of public understanding about the major causes of water pollution—particularly the role of the individual—stands as an impediment to healthy rivers, lakes, and streams as well as to effective community-based action. In 2002, River Network launched *RiverSmart*, a national education campaign designed to raise public awareness and to promote the work of local conservation groups, big and small. The presentation will provide details about the campaign—from production to implementation—and how the *RiverSmart* program can be brought to your community.

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Rivers are the embodiment of discovery, recreation, and well-being. Many have celebrated the heritage, diversity, and beauty of our waterways from the mighty Mississippi to the smallest backyard creek. Rivers are the pathways that connect communities, moving goods and people between them. They provide year-round recreation for millions to swim, fish, and paddle. Anglers alone contribute billions to the economy each year. In national polls, Americans routinely identify clean and safe water as a top environmental and health priority. A good supply of fresh water, whether from rivers or ground water sources, is the most essential infrastructure to homes, towns, factories, schools, and farms—to our communities. Today, the quality of our rivers has become the iconic representation of environmental health.

Despite the special relationship many share with our nation's rivers, most people do not realize that their daily activities have a substantial impact on the health of their local waterways. According to a 2001 National Geographic Poll, two-thirds of Americans still believe industrial output is the major source of pollution in our rivers, but we know the story is more complex. Precipitation runoff or nonpoint source pollution from farm fields, roads, parking lots, and lawns has now become the leading cause of water pollution in America today. This "people pollution" is difficult to address through such conventional approaches as regulation and permits. Many believe that the solution lies in our ability to educate and involve the public—to promote widespread behavioral change.

For the past fifteen years, River Network has worked with people that care about their rivers and communities. Headquartered in Portland, Oregon, River Network is a national support organization for over 750 "partners" including local, statewide, and regional conservation groups, public agencies, tribal governments, businesses, and numerous committed individuals. All of these entities face the challenge of dealing with nonpoint source pollution. River Network has recognized that the lack of understanding about the major causes of water pollution—particularly the role of the individual—stands as an impediment to healthy rivers, lakes, and streams, as well as to effective community-based action. Today, nonpoint source pollution is a threat to clean water as well as to the organizational might of the thousands of grassroots river and watershed groups across the country.

For these reasons, River Network committed to the idea of producing a major, national public awareness campaign called RiverSmart. This campaign would be seen by millions and involve a critical mass of individuals, organizations, and businesses in an effort to create public awareness and change.

The RiverSmart campaign was also designed to serve as a communications tool for River Network partners who could implement the campaign in their own communities. With promotion at the national level by River Network, as well as a solid grassroots strategy, RiverSmart was positioned to be the nation's largest public education campaign around the issues of clean water.

Without the generous support of corporate sponsor Swiss Re, the RiverSmart campaign would have remained just a great idea. An international reinsurance company, Swiss Re has stood by its commitment to be a socially responsible company in raising awareness for sustainability issues. As part of their Sharing Solutions program, Swiss Re provided River Network with financial support for the RiverSmart campaign, as well as intellectual capital and expertise in the areas of water quality and availability. With Swiss Re's sponsorship, it was possible for River Network to begin production of a national campaign that it could provide to all of its partners free of charge.

Production of campaign materials swung into high gear starting in the spring of 2002. River Network worked with the Metropolitan Group, a social marketing firm also based in Portland, to produce a campaign that would give the public some simple things they could do in and around their homes to help prevent nonpoint source pollution, as well as to conserve valuable water resources. Recognizing that the media is a powerful communications tool, River Network set to work on producing a set of television, radio, and print public service announcements (PSAs). All the PSAs contained the RiverSmart message: "Be smart about the things you do at home. Be RiverSmart." The materials also contained room for River Network partners to place their own name and logo identifying them as the local messenger for the campaign. Additional educational materials were also developed, including a Home Scavenger Hunt, a Top Ten Tips flyer, and a RiverSmart placemat. All the campaign materials were packaged into a Tool Kit along with a seventy-five page how-to guide to help River Network partners through the process of implementing the campaign. The Tool Kit included instruction with placing the ads, building local media relations, and organizing community outreach activities.

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With production near completion, the campaign was unveiled at the 2002 National River Rally in Asheville, North Carolina. The response was overwhelming; more than 100 River Network partners signed up to join the campaign. Many mentioned that this kind of education was badly needed in their own communities. In June, River Network mailed out over 800 RiverSmart Tool Kits—one to each River Network partner. In conjunction with the national rollout, River Network created a video news release (VNR) officially announcing the launch of the campaign. The VNR was sent out on the national news wire where CNN Headline News picked it up for a featured spot on their news hour program. Many local television news stations followed suit, airing the VNR on their own local broadcasts.

Immediately, some partners—particularly those who were experienced with working with their local media—were able to hit the ground running, launching their own local campaigns within a matter of weeks. Other partners first looked to in-house communication tools and began with placing RiverSmart print ads in their own newsletters and on their Web sites. From public events in Ohio to schools in Tennessee, on public radio in Mississippi and in newspapers throughout the Boston suburbs, the RiverSmart campaign was popping up in various communities across the country. By the end of year, around forty River Network partners had implemented the campaign in some form within their community.

But, the expectation that RiverSmart would be a national campaign capable of causing widespread behavioral change seemed off target by the end of the first year. It gave light to a few key assumptions we had made early on—the first of which was that there would be a very high level of participation by River Network partners to implement the campaign in local communities nationwide. Follow-up calls to those who signed up at the National River Rally showed that indeed interest was high, but many groups needed time to review the materials internally and decide how the campaign would fit into their larger organizational plans. And, it was a tough year financially for many groups. Despite making the materials available for free, there were costs associated with implementing the campaign, namely staff time. Many

of our partners were very enthusiastic about the campaign, but unable to take on *any* additional projects without accompanying finical support. A second assumption was that River Network would secure a national media sponsor (which we were unable to do), making it possible to deliver the RiverSmart message on a national stage.

Overall, it was a tremendously successful first year. The experience and feedback from our partners helped to shape the direction and expectations for year two. In 2003, we decided to focus primarily on working with our partners helping them build strong RiverSmart campaigns in their communities. To this end, we provided a small number of partner grants to help cover staff time, printing, and to pay for the purchase of advertising space. Grantees were selected from across the country and possessed varying levels of experience with public and media outreach work. We then worked closely with the regrantees providing personalized solutions and support to help them be successful in their local efforts. The grant program was envisioned as a way to not only help our partners implement local campaigns, but also to provide a set of success stories that could be shared with the larger network of partner groups to help boost interest and participation in the campaign in the years to come.

In conjunction with the grant program and close work with the campaign partners, River Network also continued efforts to build national media attention for the issues of the campaign. We produced an audio news release (ANR) and targeted its release to cities where partners were implementing the campaign, as well as to other major urban markets. The ANR aired on over 1,600 stations, grossing nearly seven million impressions. When much of the U.S. was experiencing drought conditions this summer, River Network drafted a series of letters addressing the issue of water-use in the home and yard and in July landed a letter-to-editor in the New York Times.

The premise of the RiverSmart campaign is that we all contribute to water problems and it will take all of us to solve them. The campaign promotes the idea that behavioral change is achievable. However, to date, we have only been able to evaluate the effectiveness of the RiverSmart campaign as a communications tool for our partners. Our campaign partners report that the RiverSmart materials have helped them to build local media relations, raise their organizational profile, and reach out to new members within the community. We believe the campaign can help more partners promote themselves, while simultaneously delivering a basic and important educational message. However, we have not reached the level where it is possible or even meaningful to measure the impact this campaign is having on a national level.

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Of course, even at this stage there have been many lessons learned and ideas on how we could have done things better. If we could go back and do it all again, it would be great to have more time to solicit partner input to help with production of the materials, as well as to spend more time following up with partners after the initial distribution of the Tool Kits. As far as advice for others, it helps to be flexible. Campaigns are subject to change and if you are regularly evaluating your efforts, it is much easier to make those changes mid-stream. We have also learned that it is important to promote the work you do. Often there are great opportunities to leverage your results through earned media coverage, and these opportunities add to the public's understanding of critical environmental issues.

Underserved Groups as Part of Community Watershed Protection: Building Inclusive Programs

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Abstract

Nonpoint source pollution remains the Nation's largest source of water quality problems. Almost half of our rivers, lakes, and estuaries are not clean enough to meet basic uses such as fishing or swimming. These facts have driven communities to become active participants in the decisions to protect and improve their waterways. Often times it is a small group of individuals who speak for the entire community. Successful programs engage all of the community from seniors and students to the traditional underserved groups.

Projects with participation from throughout the community are the best examples of the win/win opportunities that present themselves when there is inclusive representation. This starts by breaking down barriers and doing away with the beliefs about certain groups not traditionally involved. To build support, you have to begin with the assumption that everyone cares about their community.

Watershed issues affect everyone in the community and participation from a large section of the community gets the attention of decision-makers. This presentation will provide examples of successful projects and suggestions on how to engage various sectors of the community, especially those whose voices historically have not been heard.

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Introduction

Developing inclusive watershed programs that encourage greater participation from diverse groups should be a priority for community groups working to address water quality problems. Nonpoint source pollution impacts everyone's quality of life, without regard to race, class, or socioeconomic position. Underserved communities are often disproportionately affected by these problems, and successful outreach can lend invaluable support needed to assure program success.

Often outreach remains just that; diverse groups are seen as being on the outside of the movement and need to be brought into the core. Dominant groups tend to make assumptions, often incorrectly, about why other groups are not involved, without taking into account the fact that these groups have not been invited. Groups that include diversity as a part of their watershed plan know the different communities, their concerns, priority issues, and they are part of the plan.

It is easy to say that African American and other groups are not concerned about the environment, or they are too consumed with their jobs, crime, and other issues to care. This cannot be further from the truth. Studies indicate that environmental quality issues are a priority on many different levels. African American and other minority members of Congress have a record of consistently supporting environmental protection legislation.

Groups usually target people like themselves because they do not know who their neighbors are. Remember these people are your neighbors, not "those people," they care about what happens in their community. Participation in some projects may require you to feel uncomfortable, an outcome of the diverse participation. One example is differences in meetings in a diverse community. Adjustments for differences in culture, values, or communication styles can influence the success or failure of the meeting.

In some Native American communities, meetings do not start until everyone is present, so a group with a goal to start and end meetings on time may become frustrated with people not being on time. Not starting the meeting until everyone is present is respectful of Native American culture. In communities of color, meetings are a form of fellowship, and food is a part of fellowship. The cookies and refreshments served at some meetings would not be the right thing to do for that group.

In the communities disproportionately affected by pollution, there is a feeling of hopelessness and a shared belief that nothing will happen. The principles of environmental justice can help groups evaluate their program, and decide if the plan honors the diversity and different values of the communities. The 17 principles of environmental justice clarify how important it is to understand and celebrate the differences in communities. Environmental justice demands that public policy be based on mutual respect and justice for all peoples, free from any form of discrimination or bias. Environmental justice affirms the need for urban and rural ecological polices to clean up and rebuild our cities and rural areas, while honoring the cultural integrity of all our communities, and providing for all fair access to the full range of resources.

Successful outreach and education in underserved communities and in communities of color requires groups to assess the target community's concerns, attitudes, and perceptions about nonpoint source pollution. There is a belief that water quality problems are corrected in non-communities of color, while problems in minority communities are not addressed. A strong, targeted message is needed to change these perceptions.

Health and other quality of life issues are generally a priority for people in minority communities. A message that is clear, nontechnical, and familiar may stimulate a change in behavior. Message content should highlight stormwater issues, such as street flooding or water problems in homes. Community leaders are an excellent resource to help determine the appropriateness of the message; they know the issues and concerns of the community.

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Case Study: The Utoy Creek Watershed Project

A successful community out-reach project brings many diverse groups together and ultimately evolves into a close network of people from across the city supporting each other's programs and projects.

In Atlanta, Georgia, the city developed a plan to address water quality problems by rebuilding a combined sewer overflow facility in a neighborhood park. A combined overflow facility is designed to overflow untreated sewage and rainwater into urban creeks during storm events. The community believed complete separation of the combined system was the best alternative to solve the problem. Their data showed their alternative was cheaper, would update the aging infrastructure, and eliminate all human waste from the stream.

The Utoy creek community is a beautiful urban community just minutes from the state capital. Unlike most neighborhoods in Atlanta, the Utoy creek watershed has hundreds of acres of old growth forest and day lighted streams. The 16-square mile watershed has a 35-acre nature preserve, 100-acre nature center, and hundreds of acres of protected greenways the community purchased. The school campuses are large tracks from 10 to 100 acres. There are streams crossing many of the homes in the watershed.

For five years, the community did enormous outreach to gain support for their alternative. There were workshops and stream walks, a technical advisory and other committees, a community led speakers' bureau, and other projects. There was tremendous support from groups and organizations throughout the city, and many non-traditional relationships formed that continue today. The city council ultimately voted for the community's alternative, and their combined sewer system was separated, eliminating much of the pollution in the streams.

A committee made up of community members had to educate the city council so they understood the science, and how their alternative would save money. They studied the city's data and developed a proposal with a revised estimate of costs and outcome. The committee included several engineers, people with science backgrounds, and other community members. Members of the citizen led speakers' bureau participated, so they could include the technical information as part of their presentation. A mother with young children joined because she was concerned about the health risks from the raw sewage in the stream that ran across her property. Other committee members included an EPA employee and a retired planner that lived in the watershed, and they also worked with technical volunteers from other watersheds.

The citizens' speakers' bureau was a pool of volunteers able to present the issue to their neighbors. They were responsible for keeping city council members updated; they helped members understand the differences in the alternatives, and provided the questions to ask public works when comparing the alternatives.

Senior citizens, many of whom had lived in the watershed for years, made phone calls with updates and meeting schedules for the hundreds of people on the mailing list. They were able to activate the phone trees quickly, and often they were the reason for the successful turnout at meetings. The group felt strongly about keeping everyone informed, so people who were not able to volunteer their time received updates.

Another major part of the outreach to the community was changing how they viewed the streams in their neighborhood. The group led creek walks in the community to help people understand why the stream smelled like sewage when it rained. These walks helped people make the connection between the issue they were hearing about and how they were impacted.

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The year after the separation work was completed, the group hosted an Earth Day celebration in the park where the combined sewer overflow facility had been located. The turnout was tremendous; the event was attended by a very diverse group of people who had supported the project. By working together on this project, many different groups learned to respect one another; they developed understanding and acceptance of each other's differences; and shared a commitment to the environmental health of their community. A U.S. congressman, state representative, school board member, city council members, representatives of the Sierra Club and The Wildlife Federation, several local environmental nonprofits, and people from other communities throughout the city attended the celebration.

Conclusion

The Utoy Creek watershed project demonstrates what can be accomplished when the community works together to address water quality problems. Make the commitment to get to know your neighbors, and find ways to include them in the process, regardless of differences. When you understand what others value and include their concerns in the program, there is greater chance that they will want to be involved. Nonpoint source pollution does not discriminate; seek to understand; and let your program honor everyone in the community.

Reaching Multiple Audiences with One Droplet: The Salt Lake County Storm Water Coalition's Media Outreach Campaign

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In 1998 the Hartman Management Group (H.M.G.) team was awarded a consultant contract with Salt Lake County Engineering for the NPS Public Education program. We inherited an up and running program looking for a new direction. We mapped out a five-step process to fashion a new era in the UPDES Education Program—a process that led us to where we are today. The five steps are: 1) evaluate, 2) identify problem, 3) create a brand identity, 4) target a single message to an identified audience and 5) select media and methods of delivery of that message to reach the audience.

Step 1: Evaluation

Whether one wants to change the direction of a current program, build-upon an existing program, or begin a new public education program, we recommend a starting point of honestly determining where the program is in terms of effectiveness. Next, one should identify what resources, research, and materials are available to be used to reach that objective. For example, the first step we took was to evaluate the current program's effectiveness and progress by looking at the existing collateral material and designed and contracted for a public information poll.

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Collateral Material Evaluation

My staff and I reviewed all printed pieces and electronic media the coalition had produced during the prior ten years. We almost immediately concluded that the old program, with a limited communication budget, was using a disparate array of methods; was delivering different messages in several different media; was utilizing these various media in a helter-skelter approach over extended periods of time; and altogether lacked any sense of brand identity from collateral piece to piece, electronic ad to ad. This appeared to have resulted in no one message achieving any sort of depth of frequency and breadth of reach. Nearly every time someone either saw or heard a public awareness spot or picked up a printed piece about stormwater, they failed to connect the two as parts of the same whole, mainly because they were just two parts. There was no building of repetitive message upon message, but merely disjointed glimpses here and there.

It is said that it takes an individual three to five times of seeing the same message before it is remembered and an additional two times before it begins to be internalized. County residents may have seen a stormwater promotional message three times, but due to the sporadic messages and their faulty delivery it became a new message to the viewer every time. To provide us with more specific detailed information and focus, Salt Lake County commissioned a public information poll.

Public Information Poll

A public information poll was commissioned in May of 1998. The poll interviewed 450 Salt Lake County residents based upon a fair demographic population split of residents over the age of 18. The results had a 95% accuracy rate (relatively standard for the business). The survey was approximately 12

minutes, with a mix of multiple choice questions and open-unaided questions. Some interesting highlights from the 1998 poll are as follows:

- 54% of respondents believed that Salt Lake County had a problem with stormwater pollution.
- 40% of respondents believed that stormwater ended up in lakes and reservoirs in Salt Lake County.
- Only 8% believed that county residents were part of the stormwater problem.
- Of those who believed stormwater pollution to be a problem, 21% rated the number one problem with stormwater pollution as oil, grease, and antifreeze.
- 80% of respondents could not remember hearing nor seeing promotions about stormwater pollution or prevention.
- 67% of respondents had heard the slogan "We All Live Downstream" and could articulate a general inference from the slogan.

The poll supported many of our initial theories. First, while a majority of residents believed there was a stormwater problem, only 8% thought county residents were part of the pollution problem.

Second, 40% believed that stormwater pollution occurred at the lake or reservoir. This provided insight into the low number of respondents who associated themselves as part of the stormwater problem. They were simply not aware how actions in the urban setting could possibly affect the quality of water in local parks and recreation areas. They had essentially determined that someone else caused stormwater pollution.

Third, while a majority believed stormwater pollution was a problem, relatively few could remember any messages in the public media that brought attention to the problem or suggested any solutions. The coalition had been advertising and aggressively trying to educate residents, but had failed to build reach and repetition with the very people they were trying to reach. We also quickly surmised that a limited media budget made it essential to capitalize on every opportunity to achieve repetition.

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Fourth, a surprise to us was the positive responses to the "We All Live Downstream" slogan. Not only was the tag line familiar to 67% of the residents, but they could also articulate a fair approximation of what it meant. Some verbatim, unaided quotes were: "What others do affects me—what I do affects others," "Pollution affects everyone," and "Take care of natural resources."

The next building block was to create a consensus within the coalition as to what the top stormwater pollutants were in Salt Lake County and agree on a short list of simple, suggested solutions.

Step 2: Problem Identification

Using traditional facilitation methods, we were able to relatively quickly help the Salt Lake County Stormwater Coalition come to agreement on the hierarchy of the top pollutants that the group was consistently finding in stormwater:

1) Soap from cars washed on the driveway,
2) Yard waste and leaves swept or hosed down the gutter,
3) Fertilizer and pesticides sprayed on hard surfaces, and
4) Pet waste.

The consensus building was a valuable exercise on many levels. A coalition can be unwieldy—different people, different ideas, and different experiences. But, with a common agenda and common objectives identified and with each voicing a ground rule to respect all comments as valid, the consensus we reached was a powerful tool. Better results were achieved through debate, challenges, and analysis. And after self-expression and personal educational experiences, a final agreement was reached by all; each member bought into the overall game plan. With that behind us, we set out to develop a plan to achieve a brand identity.

Step 3: Create a Brand Identity

Given our limited budget and based on the long experience of key members of the H.M.G. Team, we recommended that the coalition adopt the idea of creating a spokes-character. We thought that giving personality to the campaign would help it stand out from the thousands of other messages residents are bombarded with daily. We also wanted a visual and emotional image to help people to immediately identify the character with the elements of natural stormwater and evoke a visceral understanding of the message, like the tag line *"We All Live Downstream"* had achieved.

Thus, the H.M.G. Team created our spokes-character *Droplet. Droplet* epitomizes the very essence of our message—stormwater from the heavens, that begins pure, clear, blue, should flow unpolluted to our local waterways. Figures like *Droplet (McGruff, Smokey the Bear, Cat in the Hat*) are widely used for public service and public campaigns, as they appeal to adults and children.

Step 4: Target A Message to an Identified Audience

As a coalition, we had agreed upon the pollutants that were causing the most havoc in the Salt Lake County stormwater system, but we still had to bridge a gap. The poll showed that people thought of stormwater pollution as a distant problem caused at the lake or reservoir in the surrounding mountains. They were simply not aware that most stormwater pollution occurs all around them in the valley, in the parks and recreation areas they visit and use, not only the lakes and reservoirs in the outlying areas. We knew we had to create a connection in our residents' minds that their own gutters and storm drains were the conduits for pollution.

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In addition, we also decided that we had to find a way to educate the public that dirt, grass clippings, car wash soap, and pet waste are pollutants to stormwater. Because of the cumulative effect, these seemingly harmless things put down the gutter in small amounts, on a daily basis, lead to more stormwater pollution than a few heavy polluters.

Most people would never think to pour oil, gas, or chemicals into their gutter or a local waterway. But, we needed people to understand that thousands of seemingly innocent actions, such as hosing down driveways or sweeping dirt and yard clippings into the gutter, were clogging and ruining their waterways.

With that in mind, we chose to educate people without using guilt. We wanted to create an awareness of the problem, to educate them to be more thoughtful, and to affect small changes in their behavior. Then, we had to convince people that by thousands doing a little, together we could all do a lot.

To reach our objectives we chose to include the following information in all public messages:

1) A simple definition of stormwater,
2) An explanation that stormwater is untreated water,
3) A list of the top pollution sources found in Salt Lake County stormwater,
4) Local urban recreation areas in Salt Lake County that are directly affected by stormwater and by what people put down their drains,
5) A few simple, commonsense actions that Salt Lake County residents can take to keep stormwater clean.

Step 5: Reaching The Audience

As mentioned earlier, the general public has been our main focus. We chose to use a two-pronged approach to reach them—mass media and school children.

Mass Media

We believe that a limited budget dictates a certain mass media strategy; try to dominate in one medium (with another as support) for as long a period of time as the budget will allow. It is better to run strongly in a medium for one week than to dribble out the spots over a three-month period. If the latter method is chosen, the likelihood is that by the time the audience has heard or seen the spot for the second time, they have completely forgotten their first impression and are starting over every time they see the spot. There is little cognitive repetition of message with a severely limited reach. In the beginning, the mass medium we chose to start with was radio, combined with inserts in local newspapers.

Radio

In the spring of 1999, we used 50% of our budget to run ads heavily for a two-week period on local, top-rated radio stations. In addition, we developed and produced one radio spot. While we were dominant over the time period, we found that the message lacked the visual component necessary for audiences to understand the message. At that point, we went back to the re-evaluation stage in our communication cycle.

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Newspaper Inserts

At the same time, we chose to insert a cartoon-like tabloid in the local newspapers as reinforcement of the radio flight schedules. The piece was designed to appeal to both parents and children with attractive visuals and interactive, fun, and informative exercises.

To test its effectiveness, we conducted four focus groups in 2000. Our goal was to find out if people found the tabloid interesting, informative, effective, and a preferred method of delivery. Sixty-eight percent of the people indicated that the piece itself was effective. However, a majority of participants said that when the tabloid comes as an insert through the newspaper, they assume it is a solicitation for money and disregard the entire message. Eighty-two percent said that if it were to come through the school system via their children they were more likely to not only look at the information, but to give more weight to its credibility. We now deliver a tabloid and other items directly through school children to their parents.

The re-evaluation phase is something that we try to constantly do. We are not ever content that what we are doing is the best way. We go back and back and back to test our thesis, our methods, our practices, and our progress. In this case, we kept the tabloid idea, which has been upgraded and tweaked several times, but has retained the same basic concept. What we changed was the method of delivery.

School Children

Local elementary schools have always played a role in our public education program. However, we expanded the program based upon the focus groups and the effectiveness of earnest children delivering the message to their parents—those in the best position to affect a change in the pollution problem. We have created additional resources for educators to use as they include stormwater in their curriculum. These resources include a Stormwater Video, Activity Book for Children, a Class Curriculum Handbook, and a redesigned Web site.

A major means of distribution of these materials is through a booth we host at the annual Utah Education Association conference held each fall, where thousands of teachers congregate to look for

resources and new ways to engage their children. We collect the names and addresses of interested teachers. Their interest can vary from wanting the materials shipped to them, to arranging a visit to their classroom by one of our in-house presenters.

Storm Water Educational Video

The H.M.G. Team produced a seven-minute educational video, *A Ride Through the Storm Drain*, released in July of 1999. The video demonstrates how stormwater is created; its route through the waterways and storm drains; and specifically demonstrates ways to prevent pollution. We provide the video free of charge to all county educators and residents who desire it.

Children's Activity Book

A 16-page activity book geared toward kids was designed by the H.M.G. Team to create a fun way to learn about stormwater. The activity book has been a huge success with children of all ages throughout Salt Lake County. The activity book is available free of charge to Salt Lake County educators, community organizations, and residents.

Class Curriculum Handbook

We also created a handbook for that is correlated to meet all State Board of Education requirements for fourth- and fifth-grade science classes. It provides 12 chapters of activities and experiments designed around stormwater education.

Web site

In 2003, we redesigned our Web site to become a more valuable resource to educators and children. Two pages on the Web site are designed specifically for educators and children.

> **Educators Toolbox** – This provides a resource for Salt Lake County teachers to include stormwater in their physical and earth science class curriculum. Through the Web site, they can order a hard copy of the class curriculum handbook or download directly off our Web site. In addition, we have two web-based activities geared for educators to use in the classroom.
>
> **Kid's Playhouse** – This provides a fun and interactive educational page geared to children fifth grade and younger. The page now includes a fill-in-the blank storybook, a *"Clean the Stream"* activity, games, and other educational comic strips that can be downloaded or printed off the Web site.

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Current Mass Media Campaign

They say success begets success. A somewhat unexpected benefit of the retooled education program in Salt Lake County is the addition of several new coalition members over the last couple of years. We convinced the new members that it would benefit us all to join together, rather than conduct many separate campaigns. The increased budget from the increased membership has enabled us to increase our mass media budget and refocus our media campaign toward television. Our strategy remains the same—a heavy placement in ONE medium for as long a period of time as possible. The cost of TV is greater, but the reach is far broader. Our local stations dominate our county, which constitutes almost 50% of the state's population.

Another strategy we initiated upon signing the original contract in 1998 was to waive any media commissions and put those dollars right back into the ad budget. We did not think we should be compensated twice—our consultant's fee plus the commissions. Also, we did not want to be influenced, even subtly by our own financial gain, the medium we recommended be used.

Therefore, when we were able to convert to television, we decided to try to leverage the budget by creating a partnership with one local television station. We go through a procurement process to determine what that station will be, again waiving any enticement of media trips or the like. We have the county place the schedules, not our firm. We have been able to leverage the actual cash outlay by

securing a commitment from the selected station for bonus airtime, free production of TV spots, and other useful station incentives that correlate to our objective, not to any personal incentive.

We run short flight schedules in order to create higher frequency and greater repetition of our message during the flight schedules. The flight schedules run primarily during morning and evening news and in some cases primetime, for a stronger reach.

We are confident that this media strategy has added greatly to our success, even with a limited budget. To date, we have supplemented the paid television budget with over $100,000 in bonus airtime and other freebies. In addition, we have produced two 30-second and one 10-second spot at no cost to the county. We have also appeared several times on KSL's *Our Town.* This is a local TV program airing at midday on the dominant TV station where we have five minutes to talk about our current programs. In addition, we have produced and secured rights to a customized stormwater jingle and received free advertising on two local TV stations Web sites, which include direct links back to our stormwater Web site.

Television Spots

Our current spot was produced in late 2002 as part of our partnership that year with a local TV station and has an estimated value of $45,000. An original jingle was composed and written for stormwater by GT Techno Tracks. You may know that GT Techno Tracks wrote and produced the jingle of *"Have you driven a Ford lately."* It is one of the most highly recognizable, catchiest jingles ever written. Since the Ford ditty, GT has written and produced thousands of successful jingles based upon the technology they pioneered. They use computers to statistically predetermine memorable groups of musical notes and the sequences that have been found in the most memorable hit songs.

GT used this ever-evolving technology to produce the jingle that we currently use in the 30-second television spot. If we had procured this service from GT as a stand-alone item, the charge would have been at least $35,000, including the three years rights to use the jingle.

The jingle has added benefited our current spot by helping it stand out from all the other thousands of public services messages. Even though we have a smaller budget than some other public service messages, our spot stands out more and is more memorable because of the jingle.

Bus Boards

We have been using a bus board 25 tail showing on Salt Lake County Utah Transit Authority (UTA) regular buses as a supporting component of our media campaign. Last year, we were able to negotiate two additional bonus months at a 25 showing in Salt Lake County and a bonus three months on UTA Flex Tran buses.

Stormwater Posters

To further reinforce the visual message, our creative team designed posters from the existing bus boards. The posters have been successfully used as displays in many public buildings and at public events where the stormwater coalition has hosted a booth.

At public events, the boards have played a major role in getting people to stop at the booth to inquire about our educational information. The boards have tripled visitor attendance to our booths at public events.

Movie Theatre Advertising

Last year, we began running our 30-second spot at the most attended movie theatre complex in Utah. When the last *Harry Potter* movie premiered, Jordan Commons were the number one screens of that movie in the United States and our spot was RUNNING! In the 17 minutes prior to the beginning of

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every feature on every screen (17 screens at Jordan Commons and 12 screens at The Gateway) the spot appears a minimum of three times.

It is the very definition of a captive audience—present to be entertained and informed, no channel to change, relaxed, and comfortable. The spot reaches 750,000 Salt Lake County residents (our audience) every month it is showing.

Web Page

In 2003 we redesigned <http://www.stormwatercoaltion.org/>, and made it more visually interesting, gave it a higher degree of user interactivity, provided more detailed information, and created a greater resource for teachers and the general public.

The H.M.G. Team worked in conjunction with the Salt Lake County internal technical systems management team to create a Web site that now includes a general information and FAQ page; Kid's Playhouse; Educators Toolbox; Stormwater Catalog; and a Links page.

Stormwater Drain Curb Markers

The H.M.G. Team designed a custom Salt Lake County Stormwater Curb Marker. The marker is designed to withstand all weather, is four inches in diameter, and is applied with epoxy glue to storm drains. The message on the marker reminds individuals not to dump materials into the drain because the stormwater flows directly to streams. Many neighborhoods, civic, and church groups have used the markers for community improvement projects in their area.

Stormwater Tabloid

We recently printed 50,000 copies of a full-color, newspaper-style piece aimed at adults ages 25 to 54. We will place the tabloids in public buildings and newsstands all over Salt Lake County. The tabloids contain many of the same concepts as the children's resources, but "geared down to adults!" Its main message is a cause and effect of everyday actions and simple behavior change suggestions.

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Leave Behinds

Over the past six years, the H.M.G. Team has produced numerous promotional items used as "leave behinds" or tokens for those attending various presentations or visiting our booth at various events. The items are tangible and symbolic reminders to the visitor of the messages introduced to them about stormwater. They include pencils, notepads, refrigerator magnets, key chains, t-shirts, sweatshirts, coffee mugs, baseball caps, and the like.

Stormwater Training Program

The H.M.G. Team, in tandem with the Salt Lake County Engineering's technical consultant (STANTEC), produced a 36-page, non-technical PowerPoint presentation. This training program is on CD, and available to cities for training their employees. It is designed to allow it to be tailored specifically to a department or agency within the city.

Selling Stormwater Protection Behaviors in MS4 Communities

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Abstract

Maine, as with all the states, is faced with helping our municipalities to implement the National Pollutant Discharge Elimination System (NPDES) Stormwater Phase II rules. Having been part of the stakeholder group that wrote the state regulation, which encourages municipalities to aim for documenting change in behavior rather than simply documenting outreach activities, we realized that the communities have a huge job in front of them. We decided to help the MS4s develop and implement their plans for the two minimum control measures known as education & outreach and public participation with the expertise and resources we had developed over the years. Our program included the following chronology and tasks:

1) We met with each cluster of MS4s to give an overview of the communication pyramid and social marketing principles (or how to be successful in a community based outreach program) as they relate to MS4s and Phase II,
2) We held four focus groups; the results included differences in view of stormwater from urban to suburban communities, different practices north to south in the state, and gender and age differences in use of BMPs as well as what messages were likely effective with each of the audiences,
3) We held two workshops to share the findings with the 28 communities,
4) We held meetings in each cluster to offer resource people and programs to help communities achieve their goals (e.g., Stream Team, NEMO, Coastal Stewards, Volunteer Monitoring, Lake Stewards, Casco Bay).

Time will tell how successful this approach is but at least it is based on sound social science principles, including evaluations of effectiveness for each project each year so the MS4s can determine their progress, tweak if necessary, and continue.

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Introduction

Selling Stormwater Protection Behaviors … sounds a bit like Madison Avenue and Psychology 101. Well it is. We are using social marketing principals (similar to commercial marketing) to get people to change their behaviors to ones that are more environmentally friendly.

Maine is using social marketing to implement the Stormwater Phase II portion of the Clean Water Act. The goal of the law is to protect and improve water quality. The law requires Municipal Separated Stormwater Sewer Systems (MS4s) to reduce polluted stormwater runoff. (Generally speaking MS4s are municipalities along with colleges and universities, state departments of transportation, etc. that fall under the definition of urban density.) The law requires MS4s to use education and outreach in their programs to help achieve that water quality protection. At the Maine Department of Environmental Protection (DEP), we are using social marketing practices to help our MS4s be successful.

The purpose of this paper is three fold:

1) Describe the process Maine is using to help MS4s meet the requirements of Phase II for education and outreach;
2) Share highlights of our market research; and
3) Outline the social marketing strategy we are developing with the MS4s so they will be more effective within their communities.

First: What is social marketing?

Social marketing is the application of commercial marketing science to programs designed to influence people to improve their personal welfare and that of society. It includes the analysis, planning, execution, and evaluation of any outreach program.

This is behavior change not brand change. This is not switching brands of toothpaste. Urging people to change their behavior, like recycling their used motor oil instead of dumping it on the ground, is much harder to accomplish than getting them to buy Colgate toothpaste instead of buying Crest.

Social marketing is not easy or quick to apply. Therefore, it will take time for MS4 staff who have many other things on their plate to grasp and implement social marketing principals. For this reason, DEP staff are available to help them apply these principals.

It is also helpful to follow a process. We use a Behavior Change Matrix that we modified from Douglas McKenzie-Mohr. We have used these matrices to guide other programs, and have found them very helpful in assuring that we have considered all the variables. There are also charts in *Getting In Step* that you can use to guide your process.

Maine's Strategy for Working with MS4s

1. We used a Stakeholder process to write the Stormwater Phase II permit.

The Stakeholder process results in a better product and greater buy-in. Well, it turns out the municipalities were not the only ones to buy-in. DEP staff did, as well. We realized the huge task we had given them. We felt a responsibility to help them and an opportunity to utilize the social marketing and the sustainable community practices we were learning. We also saw instant water quality partners in Maine's effort to improve and protect our waters. By helping the MS4s to be successful we would be further toward our goal of clean water.

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Key to our Phase II permit was that we required **behavior change** and **impact evaluation**. The stakeholder group accepted that success would be measured by behavior change, not by the number of brochures sent out. We require that municipalities set measurable goals/outcomes for changes in behavior (e.g., increase in amount of motor oil recycled or decrease in amount of pesticides and fertilizers that lawn care services apply).

Impact evaluation measures those indicators related to the achievement of the goals and objectives of the program. Did the target audience change their behavior? On the other hand, typical evaluation usually measures the indicators related to the process of the outreach campaign. Did you meet your milestones and keep to the budget? These are important, as well, but should not be the only type of evaluation used to measure success.

2. We met with the MS4s to learn what the local issues were.

When we asked the municipalities what their local issues were, most of them pointed to the water bodies that were in non-attainment status. They knew or suspected that they had bacteria problems from pet wastes and nutrient problems from fertilizer. They knew that people were dumping motor oil, household wastes, and pet wastes down storm drains. They also questioned whether their citizens knew the difference between storm drains and sanitary sewers. This gave us a range of subjects to test in our market research.

3. We offered *Getting In Step* training.

The next step was to offer the MS4s social marketing training. EPA funded Tetra Tech, their consultant who developed the *Getting In Step Guide*, to provide a training session. *Getting In Step* is a great guide and process to follow for a marketing campaign.

We held one meeting statewide. Our MS4s are clustered in the southern half of the state so no one had to travel more than 2 hours. We had great turnout. All the MS4 clusters were represented (14 of the 28 municipalities, along with many of the nested MS4s). The participants appreciated the networking that the statewide training offered. They also told us that they liked having one topic—stormwater. Our consultants tailored all their training examples to stormwater so that constantly reinforced the message. The evaluations of the session were very positive. The components our participants felt were most helpful included: market research, working with the media, *Getting In Step* video, networking, and resources.

4. We did Market Research to share with the MS4s.

Market research is an important component of any marketing strategy. It is used to:

- Understand your audience.
- Determine how to correctly target your campaigns.
- Identify barriers to change.
- Evaluate your success with measurable data.

(Taken from Mildner/Wilbur's Social Marketing PowerPoint)

We used a total of five focus groups in four regions to collect data on our audience. Focus groups give qualitative, not quantitative, information. A random stratified (age, gender, education) sample of 10 – 12 people is assembled to discuss an issue. The moderator has a carefully designed script to probe questions of attitude, practices, and impressions. This process gives an in-depth coverage not possible to obtain through telephone or intercept interviews. Our script covered what they knew about stormwater, what was polluting the water, and what they would be willing to do. We also tested materials from EPA's *Getting In Step Toolbox*.

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Highlights from Market Research

(Market Decisions - NPSP & Stormwater Focus Groups Report, Sept. 2003)

a) It is clear that most individuals lack basic knowledge about where stormwater goes and so stormwater is not a concern for them. In order for people to be disposed to act, they must first be aware of the issue. This suggests that a comprehensive, mass communications effort is necessary before grass roots efforts are likely to have much of an impact. The campaign needs to include the pathways stormwater takes.

"It (stormwater) goes right down and into the sewer, after that it's a mystery."

b) Most participants assume that stormwater is treated by a sewage treatment plant, as is sewage from homes. A few thought that stormwater simply flows, untreated, into another body of water. Treatment was thought to be a good thing and treatment was what participants expected.

"I think it goes to be reprocessed and reutilized."

c) Fewer than half of participants could even guess the body of water where water flowed to from their yards, storm sewers, or sewage treatment plants.

"The stormwater must drain into a swampy little brook. It probably gets in the water, I don't know."

d) Labeling storm drains. Most participants were intrigued by the idea. The labels would end the mystery of where water goes, and they would serve as a reminder that what is in stormwater is something to be concerned about.

e) Water that drains into the ground is thought to be treated naturally, as sand and soil work together to filter out biodegradable and even dangerous contaminants. We need to clarify or separate out what buffers and soil can filter and what they cannot handle.

"I have this pile of weeds and I dump waste oil there. I haven't killed any thing yet."

f) Given all the publicity about industrial polluters and the lack of communication about other sources of water pollution, it is not surprising that most people first point to industries as the major culprits. This is another reason for a mass communications effort. Many believe that what they might do has little effect as compared with what industries do. Only communications can change this perception.

"I think it's more the industrial polluters, we're contributing, but they have heavier stuff."

g) Thoughts on the potential danger from pet and animal waste were mixed. Some thought that pet and animal waste was natural, and others noted that in places it could add up to a serious problem.

h) It appears that individuals recognize the things in their houses that can contribute to water pollution, and they recognize the need for care in handling these. There is no need to tell individuals what is dangerous. However, many people do not understand the importance of the careful handling of dangerous waste. They need alternatives, such as less dangerous products and opportunities for convenient disposal. As demand is created, there needs to be an infrastructure so that individuals can readily take action. At a minimum, they expect a local and convenient place to bring dangerous chemicals for easy disposal. (It appeared that recycling reinforced environmental awareness, in that recyclers make a choice almost daily to do something to protect the environment.) Many would also like suggestions for less dangerous alternative products.

"*Why, if recycling was such a good thing, was it so difficult to do. I drove all around trying to find a recycling center that was open."*

i) The participants in the groups actually proposed a TV campaign to build awareness and create concern (or interest in action).

"I really feel if you give people information and you a make it relatively easy they will act. And with the peer pressure from other people, people do change."

j) The strongest opportunity for reducing pollution from runoff is reducing what ends up on the ground to be washed away. Many understood the connection between perfect lawns and over-fertilizing. As a result, they took pride in the fact that their lawn was not as green as their neighbors'. Some participants mentioned the "danger" flags put on lawns after a lawn service treated a lawn. Consumers believe these chemicals to be bad, want to do something about them, and say they will if reminded and supported.

"Most people that get these chemicals or these lawn services assume that it's ok because it's legal."

k) Changing practices with respect to landscaping is a different issue. Changing landscaping is not frequently done and once done is not often repeated. This issue might be tackled in a different way—perhaps by influencing the "early adopter" gardeners who set a standard for creating runoff free gardens and lawns. In addition, Best Management Practices (BMPs) need to be clear. Some participants interpreted "minimize lawns" to mean "pave more."

l) We asked participants to rank BMPs in order of the ones they would most likely undertake. The higher ranked practices (ones they rated as easier or had a lot of issues about) have been discussed above. The following practices are the ones lower in the ranking.

- ▹ Re-route gutters so that the rain does not go into the sewer system. Many did not see this as practical or important.

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- ▹ Wash your car on the grass instead of the street or your driveway. Many did not easily make any connection. Some thought that this issue was trivial; too few cars were washed to make a difference.
- ▹ Wash your car at a carwash. Most did not know why this might be good for the environment.
- ▹ Inspect and repair leaky sewers and septic systems. Most had no idea what to look for or how to check. Women said they would not go in a basement to look. Men thought that a malfunctioning system would make itself evident without inspection.
- ▹ Stabilize soil so bare soil is not exposed in areas such as ditches and yards. Most thought that this was obvious, and anyone with a garden would know that they had to do something to keep water from washing away the soil. (But, we know in Maine that we have a huge problem with soil erosion. While it may be obvious, there is no action at the level we need.)
- ▹ Do a soil test to determine the minimum amount of fertilizer needed. This action fell to the bottom of the things many participants would do.

m) There appears to be support for an incentives program. Maine's bottle bill was mentioned as a very effective program. Many thought that the bill worked because the government created a financial incentive for everyone to act. Incentives, such as pay to throw, deposits on cans and bottles, and fees on tires, were seen as acceptable ways to encourage the proper action. This may be a way to fund a Stormwater Utility District.

n) Public Service Announcement Review

Participants were shown commercials on stormwater runoff. All of these commercials were seen as effective in raising awareness of the issue. Most often participants had not thought about runoff pollution before.

One spot, called "Fish Sticks," developed for American Petroleum, features fish sticks being cut open to illustrate where oil in runoff ends up. This one got high marks for being attention getting, but lower marks for fully defining the problem. Some thought that it was too dramatic—even gross.

In another spot, a Public Service Announcement (PSA) for the Colorado Water Protection Project, a duck, a fish, and an elk all speak about the pollution that ends up in their water. Like the fish stick spot, this one got the point across about what happens to pollution in runoff. Some thought this spot to be more fitting for Maine and less sensational than "Fish Sticks." Others thought that it was inconsistent to warn about pet wastes while showing an animal in the water.

In another ad, produced for The San Diego Stormwater Pollution Prevention Project, ducks representing pollution accumulated in a flock and paraded to the sea. This ad was seen to be more effective because it showed that many small individual actions add up to a serious pollution problem. It also demonstrated that stormwater was not being treated before making it to the sea. However, some thought that the ad would not gain enough attention from viewers.

Overall, participants were very supportive of the use of advertising to get the point across, and some thought that it was critical to do so. Others thought that it was important to give people information on what to do and perhaps how (and where) to do it. For example, making sure people know where to bring chemicals.

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The results of these focus groups are backed up by the statistically valid, statewide telephone surveys we have conducted almost annually since 1996. They also mesh with focus group research conducted three years ago as part of the Soil Campaign. For more information on these see the manuscript "Maine's Dirty Little Secret: Selling the Concept of Soil as a Pollutant" by Kathy Hoppe.

5. In November, we meet again with MS4s to share the research results and recommendations for Best Management Practices.

The outreach campaigns should include the convenient practices, such as minimize use of fertilizers and pesticides, recycle motor oil, and pick up pet waste. The MS4s will need to make these practices easy for their citizens. Show them that a lawn with dandelions is acceptable and less work and expense; put plastic bags and waste receptacles in parks for pet waste; offer household hazardous waste collections; and offer convenient locations and times for recycling.

The market research found little difference in responses regarding gender, age, education, or region of the state. There does not appear to be a need to segment the target audience, except for lawn care messages to homeowners and renters who do their own maintenance.

For this meeting, we will also bring in programs they can partner with: Stream Teams, Lake Stewards (Cooperative Extension Service), Nonpoint Source Education for Municipal Officials (NEMO), Casco Bay Estuary Program and other watershed groups, Volunteer Monitoring, and DEP's own NPS program.

6. We will partner with the MS4s on a statewide campaign.

This winter we will work together toward a statewide campaign to include TV, radio, and print. Our market research shows that we need a statewide effort to assist the MS4s. Awareness of poor water quality due to stormwater is very low. People still think factories are the major problem, along with acid rain. Mainers are interested in a clean environment and willing to go to some effort to protect it. But, they are unaware and unconvinced that stormwater is a problem. Therefore, we need to start with an awareness campaign.

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We will adapt existing materials from the *Getting In Step Toolbox* CD based on the focus group research for Maine. We know we need to emphasize the following:

- Factories are history, stormwater is the current leading cause of poor quality,
- The pathways stormwater takes—both running over the land, as well as once it hits a storm drain, and
- Easy BMPs, working up to more expensive (time & money) practices.

Our plan is to use our DEP budget to adapt materials to Maine and then buy airtime. Relying on public service announcements will not get our message out at times when our target audiences are watching, listening, or reading. Our partners, the MS4s, will also put up money for airtime and leverage more time from local stations and papers.

But, providing education is not enough to get action. As scientists, we tend to present facts and lots of data to our audience with the assumption that we are informing people on the issues. Rather, the messenger needs to persuade the target audience by making the data relevant to their lives. People do not act on data, but they act on what the data mean to them. Motivating the public requires additional social marketing techniques: partnering with other groups, using social norms, involving community leaders, asking for commitments, and using prompts.

7. We will help the MS4s evaluate their programs.

We are in the process of developing a survey tool the MS4s can use to track and evaluate their outreach efforts. The survey will measure what a significant portion of the population thinks about local water quality, stormwater, and present practices. To simplify the data gathering, we are suggesting the municipalities survey their own employees. While not totally representative of the whole population and not randomly selected, the survey should provide a glimpse into the community. Surveying this segment of the population will not only help the MS4s know their audience better, but also can be redone as needed to assess increased awareness, and greater use of BMPs. This is just one way municipalities can

evaluate their efforts. Actual tracking of behavior changes, such as an increase in HHW being brought to collection sites and an increase in people picking up after their pets, is another.

What Market Research Changed in our Strategy

Market research has changed the direction we are taking with the MS4s.

- We had not been planning on a statewide media campaign; we were going to start at the community level and focus on community actions. Now we are preparing a media campaign, in addition to sustainable community programs.
- We will acknowledge the role that industry has played in water quality problems, but they have cleaned up their act significantly and, with the exception of some of our major rivers, are no longer the largest factor.
- We will clarify the path that stormwater travels across yards and parking lots and into the sewers—combined, and otherwise.
- We will encourage the more acceptable BMPs (being sure the infrastructure will support them) and work toward the harder ones.

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Adopt-A-Catch-Basin

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Abstract

In southern California, much of the public believes that pollution found in streets ends up at the treatment facility for purification and discharge into the ocean, the Santa Monica Bay. The public does not consider that this nonpoint source pollution is the single largest source of pollution in this region, causing the Bay to be on the federal Section 303(d) list of impaired water bodies. Being listed means that beneficial uses of the Bay, such as body contact and fishing, are degraded: people cannot fully participate and enjoy the Bay, and local wildlife suffers.

In an effort to provide community outreach to inform the public about the connection between what people leave or dump on streets, sidewalks, and landscape, all of which ends up in the storm sewer and the Bay without any treatment, the city of Santa Monica launched an Adopt-A-Catch-Basin program. The city's Environmental Programs Division felt that exposing the public directly to what goes into a catch basin or storm drain would be a graphic, hands-on way of demonstrating the dangers of "casual" littering and failure to not pick up after pets, or the purposeful dumping of pollution into these street openings. This program has two components: first, the city installs catch basin inserts in three different land use area so as to remove solids and floatable pollutants, as well as some soluble pollutants. Second, city staff and local non-governmental organizations developed an educational program in which residents and businesses adopt these insert-retrofitted catch basins, monitor them for a specific period of time (e.g., report to the city problems or full inserts/baskets), and participate in the cleaning out of these locations. This one-on-one program informs the participants about the types of pollutants found in urban runoff, how catch basins lead directly to the ocean, and the impacts that nonpoint source pollution has on the local beaches and economy.

The city program, funded with a grant from the Santa Monica Bay Restoration Commission's Public Involvement and Education Program, rotates the location of these inserts every four months. Data on types and weights of pollutants is collected. By adopting a catch basin, adopters buy-in to the program, and develop a commitment to preventing pollution and informing others outside the program. When people have an understanding of the urban runoff problem and develop a commitment to its solution, they act responsibly and rationally to change pollution-causing behaviors and prevent nonpoint source pollution.

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Introduction

Urban and agricultural stormwater discharges have contributed to degraded water quality throughout Southern California and the United States. For example, more than 150 water bodies are on the California 303(d) list of impaired water bodies in Southern California. As a result, stormwater management agencies are implementing various Best Management Practices (BMPs) to control stormwater discharges and reduce or eliminate these water quality impairments. The BMPs are extremely varied and may include public education, installation of treatment facilities and devices, or the routing of runoff through biofilters to reduce or remove constituents of concern, such as trash, debris, sediments, or toxic constituents.

In Southern California, much of the public believes that pollution found in streets ends up at the treatment facility for purification and discharge into the ocean, the Santa Monica Bay, as if this pollution followed the same path as effluent from toilets, showers, and sinks. Combined systems do exist in much of the East Coast. In the West, most systems are separate: sanitary sewer and storm sewer systems. The public does not consider that this nonpoint source (NPS) pollution is the single largest source of water

pollution in this region, and actually throughout the United States, causing the Santa Monica Bay to be on the federal 303(d) list of impaired water bodies. Being listed means that beneficial uses of the Bay, such as body contact and fishing, are degraded -- people cannot fully participate in aquatic activities and enjoy the Bay to its fullest potential (as in the past), and the local wildlife suffers.

In an effort to provide community outreach to inform the public about the connection between what people leave or dump on streets, sidewalks, and landscape, all of which ends up in the storm sewer and the Bay (Southern California has separate storm and sanitary sewer systems) without any treatment, the City of Santa Monica launched an Adopt-A-Catch-Basin program. The city's Environmental Programs Division felt that exposing the public directly to what goes into a catch basin or storm drain would be a graphic, hands-on way of demonstrating the dangers of "casual" littering and failure to not pick up after pets, or the intentional dumping of pollution into gutters, curbs, or these street openings. This program has two components. First, the city will install catch basin inserts in three different land use locations to remove solids and floatable pollutants and some soluble pollutants. Second, city staff and local non-governmental organizations will develop an educational program in which residents, institutions, and businesses adopt these insert-retrofitted catch basins, "watch" them for a specific period of time, report to the city problems or full inserts (baskets), and participate in the clean-out of these locations. This one-on-one program informs the participants about the types of pollutants found in urban runoff, how catch basins lead directly to the ocean, and the impacts that NPS pollution has on the local beaches and economy. Participants will be able to see, touch, and smell the impacts of bad behaviors and urban runoff impacts. (The program was anticipated to begin last spring, but due to a delay in completing the contract documents, the program will begin later this year.)

The city program, funded with a grant from the Santa Monica Bay Restoration Commission's Public Involvement and Education Program (PIE), rotates the location of these inserts every three to four months. Data on types and weights of pollutants are collected. By adopting a catch basin, adoptees buy-in to the program, and develop a commitment to preventing pollution and informing others outside the program. When people have an understanding of the urban runoff problem and commitment to its solution, they act responsibly and rationally to change pollution-causing behaviors and prevent NPS pollution. This leads to improved water quality and beneficial uses of the Bay, a win-win strategy for people and the environment.

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Background

The release of trash and debris into the streets of Los Angeles County continues to be a significant problem. With the passage of Total Maximum Daily Load (TMDL) limits for the Ballona Creek (Trash TMDL) and Santa Monica Bay (Bacteria) watersheds, the need to prevent trash and Pollutants of Concern (POC) from reaching the storm drain system and impacting local water bodies is greater than ever.

The City of Santa Monica has an extensive stormwater management program, begun in the mid-1990s. A city council and management that are uniquely supportive of environmental stewardship (demonstrated by the passage in 1994 of the Sustainable City Plan, which promotes efficiency uses of natural resources and the reduction and elimination of pollution), support this program. The city has demonstrated its commitment to reducing urban runoff pollution through the many structural BMPs that have been installed:

- Catch basin inserts and screens,
- In-line/off-line BMP devices of a larger scale, screening-separation,
- Permeable paving materials,
- Infiltration pits, and
- Santa Monica Urban Runoff Recycling Facility (SMURRF), the first of its kind.

The city has had a number of educational programs to inform and train city employees, businesses, and students. Training people in the causes of urban runoff pollution and solutions is one strategy to curb this type of pollution and is called source control. This strategy is generally a lower cost solution to urban runoff pollution. It requires more staff time and interaction with the public.

Since 1999, the city has been fortunate in receiving a number of county, state, and federal grants to install structural BMP devices and systems to remove pollution from dry and wet weather urban runoff flows. With the awarding of these recent grants, much focus of staff time has been on structural controls over source controls. Structural controls can be effective in removing POCs from runoff, though one still has to deal with behaviors that cause pollution—people are still causing pollution. Structural controls are end-of-pipe solutions to treat the problem, not prevent the root causes of pollution—people's behaviors. Moreover, structural controls, in general, are more costly solutions than source control, preventing pollutants from getting into runoff in the first place. This strategy, once in place, requires less staff time and no public involvement. The ideal solution is to prevent POCs from getting into runoff through source control.

The city was approached by the organization Adopt-a-Stormdrain (recently changed to Adopt-a-Waterway) over a year ago to participate in a unique program of urban runoff pollution control. The signs say, "Cleaner Storm Drains, Cleaner Oceans. Please do not litter." The program posts attractive signs in communities along busy streets; the signs are funded by contributions from local businesses. The financial contribution by these businesses covers the cost of signs and helps support BMPs in that community. The BMPs can vary from source to structural controls. The program is a win-win strategy: a city gets badly needed funds to support stormwater management, signs publicize the sponsoring business and the problem of runoff pollution, and the organization carries out its objective of matching cities with financial resources to support BMPs.

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However, the City of Santa Monica has specific and limiting signage requirements. While the concept of using signs to publicize urban runoff pollution problems and financial resources from outside sources is an attractive one, the city has strict guidelines on the types of signs and locations for posting. In this case, the Adopt-a-Stormdrain program was not a suitable match with the city's signage guidelines. While the strategy was appropriate, the program required tweaking if it were to fit into the city's guidelines.

Considering the city's need to increase and integrate source control BMPs with existing structural concerns, city staff developed a new concept tailored after the adopt-a-mile program but with some characteristics of the Adopt-a-Stormdrain program. The city decided to develop a program that partnered source control and structural control measures into one program. Though structural control forms the basis of the program, the ultimate objective is behavioral change and source control, using the structural BMP as a rallying point for in-the-field, hands-on experience. Fortunately, a grant program of the Santa Monica Bay Restoration Commission, Public Involvement and Education (PIE), was available for which to apply. The city submitted an application and was awarded a small grant to implement the project. The project was expected to be implemented beginning in Spring, 2003, but due to delays in completing paperwork and final contracts, the project will not begin until later this year.

The City of Santa Monica's Adopt-a-Catch-Basin program (ABC Program) seeks to promote community outreach, awareness, and education throughout the Santa Monica community about urban runoff pollution (types of pollutants and their sources) and stormwater pollution prevention through source control (reduction) and structural control (technology). The ABC Program will explain to the public the potential health risks associated with swimming in the Santa Monica Bay contaminated by urban runoff, show the hidden impacts caused by people in the urban setting, and increase public knowledge about solutions in a watershed setting. The ABC Program's goal is public buy-in for the benefits of reducing trash, litter, and other POCs found in the storm drain system of Santa Monica. The program seeks to connect people's careless or irresponsible behaviors to direct impacts on the Santa

Monica Bay. The city will partner with three groups to work with a range of audiences in a hands-on, in-the-field format, exposing them to pollution problems and solutions. This model outreach program can be repeated throughout the city and in other cities, with similar multi-facet benefits to the coastal environment, for beach-goers, and wildlife.

Program Description

The city already has an extensive structural BMP program, as mentioned above. Specifically, the city has installed, through outside grants and the city's Stormwater Utility Fund, over 400 catch basin and storm drain inserts and screens. These simple and effective devices catch most trash and debris that flow off streets. Some of these devices have special media to filter out hydrocarbons, appropriate for areas more prone to vehicle leaks, such as near auto repair shops. City staff effectively maintain these devices and keep records of types and amounts of materials removed. However, the public does not readily see these devices. They do not know or understand the battle that is being fought daily on the streets. So, while the city can maintain these devices and remove annually thousands of pounds of materials from runoff, before the runoff enters the Santa Monica Bay, people's behaviors will not change.

To bridge this gap of affecting people's behavior, the city embarked on a new strategy; get the public involved in controlling pollution in a hands-on approach. Born was the idea to combine source and structural controls into one project. The city would use its existing catch basin/storm drain inserts (structural control) program and overlay a public involvement and education (source control) program. This strategy was a perfect fit with the local PIE grant program.

The ABC Program involves a number of tasks that will be described below:

- Signage
- Sites
- Stakeholders
- Monitoring-Reporting

Signs will be designed to meet city requirements; they will fit into the city's aesthetic guidelines and into locations that do not cause traffic flow problems. The project will target the three major land use sectors: residential (single-family and multi-family), commercial, and institutional (schools).

Some stakeholder groups, such as residential, commercial, and institutional, will be given the opportunity to adopt a pre-determined catch basin or storm drain near their properties. These groups will become the adoptees. The city will oversee the project and provide the signs and inserts. Local environmental groups will participate in developing the educational materials and assisting in community organization and citizen monitoring. These groups include Heal the Bay (HTB) and Santa Monica BayKeeper. The program will provide a hands-on educational component, including on-site presentations regarding urban runoff pollution and prevention, field trips to the HTB Santa Monica Pier Aquarium Museum to learn how pollution affects our beach community, and a visit to the SMURRF. Age- or sector-specific educational materials will also be distributed to the adoptees including a sign posted at their respective catch basins, activity sheets for school children, and brochures. The signs will resemble street signs and denote the adoptee, the pollution prevention hotline number, and logos of the sponsors.

Monitoring will involve adoptees observing the status of inserts on a regular basis. Is the insert empty, half-full, or full and in need of cleaning? Is the insert in need of repair? Did you see someone dump something into the insert? Adoptees will contact the appropriate city staff to report their findings. Where appropriate, given the appropriate legal permissions, adoptees will participate in cleaning the inserts, recording amounts and types of debris removed, and, more importantly, seeing how bad behaviors cause pollution. Even the simple behavior of dropping a cup or plastic bag in the street causes pollution. Monitoring and in-the-field participation by adoptees will drive home the message. Adoptees

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will see, smell, and feel the problem. One goal is that the impact of experiencing what these devices remove will galvanize the adoptees to change behavior and tell families, friends, neighbors, and colleagues. Volunteers will have the opportunity to watch their catch basin being cleaned. This activity will provide the perfect opportunity to bring all the pieces of the program together and instill a sense of responsibility to the adoptees.

The city will compile the data gathered by the program's volunteers from the inserts and clean-outs. Reports will be produced from this project and shared with the adoptees and community, as well as the grantee.

The program also intends to offer field trips to other people in the community who hear about the program through local publicity, such as newspapers, city cable and Web site, and radio spots.

The program is planned to run for three to four months, after which time the inserts will be removed and installed at new locations with new adoptees. In this way, more of the community is exposed to the problem and solution.

Funding from the grant covers sign production, educational brochures, and the purchase of inserts. The city will post and maintain the signs, install and maintain the inserts, and produce reports.

Summary

Urban runoff or nonpoint source pollution is the single largest source of water pollution and degraded water quality in the United States. Pollutants found in urban runoff are impacting the water quality of hundreds of waterways. Impacts on water quality cause the loss of many beneficial uses of water, such as bathing, swimming, fishing, surfing, breeding and habitat protection. In Southern California, recent lawsuits have forced state water quality control agencies to develop, approve, and promulgate to municipalities new nonpoint source water standards (Total Maximum Daily Loads standards) for implementation. As part of the Clean Water Act, these standards are designed to reduce pollution loading in water bodies, and are becoming a part of NPDES (National Pollutant Discharge Elimination System) permits and Basin Plans.

The City of Santa Monica has an extensive structural BMP control program. Hundreds of BMPs are found throughout the city, on private and public property. Though structural BMPs are effective in removing pollutants found in urban runoff, they are expensive to install and maintain. Furthermore, they only treat the problem; they do change people's behaviors of allowing pollutants to enter runoff or streets. Source control measures change behaviors, thus they are more cost-effective by preventing the problem in the first place. The city sought to combine its effective structural control program with a new source control strategy.

The Adopt-a-Catch-Basin project seeks to integrate source and structural BMP controls into one program. This project will involve different parts of the community in a hands-on, in-the-field program, exposing the public to the causes of urban runoff pollution, as well as what the pollution looks like before it enters the storm drain system and flows untreated into the ocean. Participants in the program will get a first-hand look at what stormwater maintenance crews across the county see everyday; they will see the filth that enters our water bodies. This pollution is preventable if we curb those behaviors that result in pollution on our streets, such as littering, failing to pick up after a pet, and allowing vehicles to leak. Hopefully, with exposure to what happens in the field, the participants will realize that we are all part of the problem, and more importantly, we can all be part of the solution by simply shifting some poor practices to more sustainable ones that reduce nonpoint source pollution.

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"GROW GREEN": How to Have a Healthy Landscape AND Healthy Kids, Dogs, Birds, and Water

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Abstract

"Grow Green" is a water quality education program that provides homeowners and gardening retailers with environmentally sound solutions for landscaping problems. It is a science-based approach that is practical and accessible to the public. *Grow Green* is a partnership between the city of Austin's Watershed Protection Department and the Texas Cooperative Extension to protect water quality. It is, we believe, one of the first programs in the country to take such an extensive and proactive approach to earth-wise landscape management.

With nursery staff identified as a primary source for landscaping advice, *Grow Green* developed partnerships with 49 nurseries and home improvement centers (nearly all of the local gardening outlets). In exchange for free materials and landscape training, the retailers provide the display space for 19 fact sheets targeting pest and disease management, turf care, general landscaping information, as well as a 44-page color guide to native and adapted plants. With limited staff, this "self-serve" distribution method offers easy access to earth-wise information at the point of purchase for landscape chemicals. Bimonthly fax alerts and video training provide sales staff with convenient, in-house training.

Grow Green takes a positive approach to landscape management. Rather than emphasizing the dangers of chemicals, it identifies problems and gives practical solutions. It doesn't say to eliminate chemical use; rather, it encourages least-toxic options and proper application rates through integrated pest management techniques. Using the Washington Toxics Coalition's product toxicity rating system, fact sheets also rank locally-available products from least to most toxic. The rating covers not just water quality, but also human health and wildlife hazards to address varied citizen concerns. By listing diverse products, nurseries are not threatened with reduced sales. Instead, they can adapt their product purchases according to public demand.

Grow Green staff also coordinate the Green Garden network, which consists of staff from six city departments who share expertise and work to avoid duplication of effort. The Stillhouse Spring Cleaning project, a *Grow Green* offshoot, targets 200 homeowners in a local springshed. Initially created to reduce the excessively high nitrate levels in the spring through education, it has become instead a grassroots research project. Soil tests of all the yards and a follow-up study were instrumental in showing the benefits of organic fertilizers and lowering statewide recommendations for fertilizer application rates by 75%.

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Austin, Texas is a city with an environmentally aware council and populace who not only support, but demand, regulatory, structural, and educational efforts to protect the city's water quality. Because there is little heavy industry, but increasing urbanization, most pollution prevention efforts target citizens. With earth-wise landscaping-related programs residing in each of six city departments, gardening has become a major focus of this homeowner education.

While the groundwork for many landscaping-related recycling programs (compost, composted sludge, Don't Bag It) and water conservation efforts was laid in the early to mid-1990's, the water quality component, Grow Green, was not introduced until 2000. A year later the Stillhouse Spring Cleaning project was initiated in the hope that extensive earth-wise landscaping education in the surrounding neighborhood would reduce the high nitrate levels in Austin's Stillhouse Hollow Spring and provide a true performance measure for the benefits of water quality education.

All of these programs had been operating in individual departments under their various missions for years. A council resolution in 2002 initiated an effort to unify these diverse gardening components into

the Green Gardening Network. This greater coordination allows staff to pool resources and avoid duplication of effort.

Each of these water quality programs: Grow Green, Stillhouse, and Green Gardening, stands on its own. The following details the strengths and weaknesses of these programs and includes lessons learned throughout the process.

Grow Green

Grow Green is a water quality education program that provides homeowners and gardening retailers environmentally-sound solutions for landscaping problems. It is science-based, practical in approach, and accessible to the public. In an effort to offer as complete a guide to landscaping as possible, support other city missions, and appeal to those citizens interested in the wide variety of health and environmental concerns, Grow Green provides a comprehensive approach to sound landscaping. It offers inclusive landscaping guidelines that emphasize practices, plants, and products that help protect multiple resources—water quality, water quantity, wildlife habitat, native species, and precious landfill space. It encourages planning and prevention, rather than treatment to avoid environmental degradation.

Grow Green is a partnership between the City of Austin's Watershed Protection Department and the Texas Cooperative Extension to protect water quality. City scientists have identified landscaping chemicals as an important source of Austin's water quality degradation. Nitrate levels, often tied to fertilizing, are eight times higher in our urban creeks than in undeveloped areas and ten times higher in urban ground water. The banned pesticide, diazinon, has been found at levels known to cause adverse effects on aquatic life, and recent screening tests have detected triazine herbicides in our ground water. Recognizing that pollution prevention is much less costly than remediation, Grow Green, we believe, is one of the first programs in the country to take such an extensive and proactive approach to earth-wise landscape management.

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Components:

With nursery staff identified by homeowners as a primary source for landscaping advice, Grow Green developed partnerships with 45 nurseries and home improvement centers, nearly all the local gardening outlets. In exchange for free materials and landscape training, the retailers provide the display space for 19 fact sheets targeting pest and disease management, turf care, and general landscaping information. With limited staff, this "self-serve" distribution method offers easy access to earth-wise information at the point of purchase for landscape chemicals. In addition, the city's new 48-page, color guide to native and adapted plants is a signature piece for the program and includes extensive plant information, including photos, size, light needs, maintenance tips, deer resistance, and habitat potential. Bimonthly fax alerts and video training provide sales staff with convenient, in-house training.

Successes:

The city's partnership with the Texas Cooperative Extension has proven beneficial. With Austinites often perceived as "those hippie environmentalists," a partnership with a respected, conservative research institution has increased Grow Green's credibility.

Grow Green takes a positive approach to landscape management. Rather than emphasizing the dangers of chemicals, it identifies problems and gives practical solutions. It does not say to eliminate chemical use, but encourages least-toxic options and proper application rates through integrated pest management (IPM) techniques. Using the Washington Toxics Coalition's product toxicity rating system, pest and disease fact sheets rank locally-available products from least to most toxic. The rating covers

not only water quality, but also human health and wildlife hazards to address varied citizen concerns. Also, by listing diverse products, nurseries are not threatened with reduced sales; they can adapt their product purchases according to demand.

The first challenge for Grow Green was to recruit the landscaping retailers. We first surveyed a variety of retailers and got a positive response to the program concept. We then created attractive, eye-catching materials that the stores welcomed. We also needed to combat the competition for space in the nurseries, particularly since our materials are non-revenue producing. As a result, we chose the most space-efficient displays available. To date, nearly all of the local nurseries and all of the Home Depots, Lowe's, and Wal-Marts in town are participating, an impressive accomplishment. Since 2000, close to 500,000 fact sheets have been distributed to homeowners and in its first year, 60,000 plant guides are in the hands of homeowners. Last year, there were over 53,000 hits to the Grow Green Web site <http://www.growgreen.org/>, while this year 70,000 are anticipated.

Obstacles:

The program has not been without its challenges. The day prior to launch, city lawyers received a "cease and desist" letter on use of the name, Grow Green. While a Web search turned up only one other Grow Green in Massachusetts, we had not thought to check on misspelling the name as Gro Green. A Plano, Texas landscape maintenance company was unhappy that we were ranking chemicals and felt we could harm their business, which included chemical use. After considerable scrambling, the Grow Green logo was registered as a Texas and national trademark, but a promise was made to limit the program under the name Grow Green to the Austin metropolitan area, a concern for our partners, the Texas Cooperative Extension, who have plans to expand the program.

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In the three-year period since inception, several initiatives were tested and eliminated. "Earth-wise" labels had been created to place on nursery shelves next to least toxic products. However, particularly in the larger stores, the products were moved often, but the labels were not. This often left an earth-wise sticker next to a very toxic product. We scratched that idea.

A "Plant of the Week" is published each Saturday in the Austin newspaper. To give nurseries a heads-up for ordering, Grow Green supplies our partnering nurseries with a list of upcoming plants. We also provided full color cards to place in their stores, promoting the plants. However, particularly in the large stores, the cards, which took a considerable effort to produce, were not being used because of the constant need to update them. We have recently eliminated the cards, but will continue to fax the list of upcoming plants.

Success is also a dilemma! Because we have been able to recruit both large and small retailers, we need to meet very diverse needs. While we have taken the Integrated Pest Management approach of recommending pesticides as a last resort, for example, the small organic nurseries do not think we are "green" enough. However, our more moderate approach has allowed us to recruit the home improvement centers that, by the sheer volume of sales, can have the greatest impact on changing attitudes and improving water quality.

Although Grow Green has been successful, other cities have had difficulty recruiting home improvement centers as partners. We made a few strong, supportive contacts at Home Depot who helped convince management that the program was science-based and supported the well-being of their community; we worked with them emphasizing their corporate policy to "do the right thing." Once Home Depot was on board, Lowe's and Wal-Mart did not want to be left behind.

This large versus small nursery attitude has also made sustained training difficult. The smaller nurseries tend to have a consistent staff that is well trained and looking for advanced classes. The home improvement centers, on the other hand, have rapid turnover and need program basics each season. We have tried introductory classes, hands-on diagnostic clinics, and also video training for in-store use, all of which have been well received, but have not attracted as many participants as we would have liked.

This year we will initiate a new approach. All sales staff will be invited to two, half-day sessions with "big name" speakers. To ensure a high enough attendance and make an initial attempt to expand the message, invitations will also go out to local landscape contractors, pest control managers, and city landscape staff. To address the frequent turnover at the home improvement centers, the Grow Green Coordinator will do in-store training in February for the new employees, before the peak landscaping season begins. This training will walk sales staff through basic program principles and how to direct people to handouts.

Grow Green has met with considerable success in its first three years and will continue to be a mainstay of the water quality education program. The concept, principles, and most material content lend themselves very well to replication in other areas. Many nearby cities have purchased Grow Green materials to help them with their new Phase II National Pollutant Discharge Elimination System (NPDES) requirements. The local river authority also plans to expand a limited version of Grow Green as a pilot program in two nearby counties. Nurseries outside the city have also purchased materials to better serve their customers.

If staffing or expertise is limited, forming a partnership, such as the city and the Cooperative Extension's, helps leverage resources. The essential component would be to adapt existing material to meet soil and climatic conditions of the area and ensure that material remains current. Nursery outreach also requires a minimum of one staff person for a city the size of Austin; if staffing were unavailable, an option would be to start placing materials at public governmental venues, such as parks or museums.

Stillhouse Spring Cleaning

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Stillhouse Hollow Spring is a beautiful, continuously flowing spring in the heart of a lush preserve over the Northern Edwards Aquifer in Austin. It also has one of the highest nitrate levels of any water resource in the city, and is the sole known site with deformed aquatic salamanders.

Surprises:

Located adjacent to an established neighborhood of well-maintained homes, the spring was chosen as an education pilot program where Grow Green principles would be put in practice, and a giveaway of a carefully chosen fertilizer would take place two times a year. The goal of Stillhouse Spring Cleaning, which began in 2001, is to reduce nitrates in the spring from 7 mg/l (twice the Texas level of concern for aquatic life) to 3.5 mg/l by 2006. The program, however, has been fraught with surprises since the beginning. First, a dye trace of a neighborhood sinkhole believed to be well within the springshed did not reach the spring (nor any other known spring nearby). Second, soil tests of 200 lawns confirmed that recommended fertilizer ratios were not necessarily appropriate for established Austin lawns. While a ratio of 3-1-2 or 4-1-2 (nitrogen: phosphorous: potassium) has been the standard recommendation for years, soil tests showed that most residents needed additional nitrogen but had enough phosphorous and potassium in the lawns for a lifetime! This caused a dilemma: how could we recommend fertilizers high in fast-moving nitrogen, as the soil tests would indicate, when our goal is to decrease nitrates in the spring?

As a result, the city commissioned Texas A&M University to do a greenhouse study comparing nine different types of fertility treatments for both runoff and leachate. Results showed that organic fertilizers produced not only denser and healthier turf, but were much better for water quality than synthetic products. The study also brought together horticulturists and soil and water quality scientists who determined that standard fertilizer application rates recommended since the 1980's were excessive. Combined with the practice of leaving grass clippings on the lawn (which returns 60% of the needed nitrogen and 100% of the necessary phosphorous and potassium to the turf), new recommendations call

for the use of half as much fertilizer, half as often as prescribed on most bags. Another interesting side-note is that sulphur-coated urea (one type of slow release) fertilizer proved not to be slow release in Texas, presumably because of the intense heat. Previously, we promoted slow release as a benefit to water quality. Further tests on other slow release products have resulted from the Grow Green study, and results are expected this winter.

What has happened to the spring through this testing? Initially, after the high phosphorous and potassium readings and before study results, we gave away 21-0-0 fertilizer. As feared, nitrate levels in the spring spiked. After the study, we gave away an 8-2-4 organic product because there are few natural fertilizers with high ratios of nitrogen and low phosphorous and potassium. With 50% of the residents participating, nitrate levels in the spring have stabilized, although still at very high levels, but the spikes to 10 mg/l seem to have been eliminated. This is leading the city to consider whether or not the high nitrates could be coming from a sewage leak (though that source was initially eliminated). The spring will be tested shortly for caffeine, one of the few constituents related solely to human waste.

Have we been able to change behavior? A January 2003 survey of Stillhouse residents showed that 54% have changed their lawn care practices in order to reduce pollution, and with each fertilizer giveaway, we add new program participants.

We sometimes joke that we are the ones being educated by the Stillhouse Spring Cleaning program, and that it has become instead a grass-roots (literally!) study. It has however, had considerable impact. For the first time in its history, the education program is leading some of the scientific query rather than vice versa. Also, with the new fertilizer recommendations, this small neighborhood project has the potential to greatly expand water quality benefits, as Texas A&M promotes these findings statewide.

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The Green Garden Initiative

An Austin City Council member conceived the Green Garden Initiative. Well known as a strong water quality protection advocate, he was surprised to be told at an organic nursery that his request for a much-advertised weed and feed product was environmentally unsound. He wondered if the city was not doing enough to educate citizens on appropriate landscape practices.

As a result, the Green Gardening Initiative came about. It began with nine public meetings with various combinations of close to 100 people from the nursery, grower, Neighborhood Association, regulatory, landscape designer, and maintenance communities. Together with city staff they developed a five-year workplan for distributing the earth-wise landscaping message.

Staff from six city departments meet regularly to streamline their efforts, share new developments, and maintain their relationship with the community. Two years into the workplan, they have created materials, signage, a demonstration garden, held several Green Garden homeowner training classes, and exhibit together annually at a Garden Festival. A new entry is the Award-Winning Yard of the Month program that recognizes exemplary green gardens, while bringing attractive examples of earth-wise gardens to the neighborhood level.

The Green Garden Initiative is accomplishing more than just better efficiency between city programs. It has produced influential advocates in the community, some of whom were initially very critical of the city's efforts to "lead by example." Networking through the Green Garden Initiative, we have received free landscape design assistance and pesticide monitoring of our springs, in addition to well-respected speakers for our trainings. It has helped make Integrated Pest Management Plans more

"citizen-friendly" and simplified and standardized some aspects of city code and restrictive covenants. In short, it has helped create an open dialog between the government and its citizens.

Conclusion

In conclusion, the City of Austin supports its educational outreach for water quality. While we believe our elementary and high school programs are a great long-term asset and have the potential to influence parents and teachers today, our landscaping education targets the adult market (those most likely to pollute) in a very practical way—in their own backyard.

Our outreach programs are based on the concept that prevention is much less costly than remediation, and in the case of nutrient reduction, education is often the only solution. We have found that stormwater runoff ponds (with the exception of wet ponds) have had little success in capturing nutrients. For example, a pond that could treat the Stillhouse Hollow neighborhood would cost over $650,000 to build, but there is no available land on which to locate it!

The homeowner education effort is now well established, but as with all programs it needs nurturing. There are vast areas left to tackle as time and funding permit. The main missing piece is a business outreach component; Can we get Home Depots to carry and expand their least toxic product lines? Can we work with landscape maintenance companies to follow the city's reduced fertilizer recommendations? Can we get Pest Control Managers to eliminate regularly scheduled treatments? Can we get landscape designers to plant native and adapted plants? For the time being, we must be content to reduce landscape pollution one yard at a time.

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"Beneath the City of Ooze": Reaching Youth through Adventure Books

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Abstract

"The name is Blonde. Jane Blonde." Jane Blonde (Agent 009) and her partner Napoleon Soil (Agent 001) are back! Napoleon and Jane are also known as the Secret Agent Worms, and they're ready for action.

Their first full-color adventure book, *The Disappearing Earth*, tackled the issue of soil erosion, bringing home an armload of top honors from Agricultural Communicators in Education, an international organization of communicators from land-grant universities. The Secret Agent Worms' new book, *Beneath the City of Ooze*, is due to be published in August 2003.

This time, our two agents from E.A.R.T.H. (**E**spionage **A**gents with **R**eally **T**errific **H**air) are going beneath the city streets to find out why Sparkle Lake is becoming polluted. Their only clue: it has something to do with the storm sewers. Unfortunately, being worms, Napoleon and Jane do not boast great brain power; they are convinced that evil agents from M.U.D. (**M**ean and **U**nfriendly **D**oofuses) are behind the pollution. So, Napoleon and Jane take off in pursuit of M.U.D. agents, only to be captured in the storm sewers by two sinister city rats. Along the way, the reader learns about storm water and nonpoint source pollution, thanks to the observations of Jane's wise grandfather, who tags along for the adventure.

Beneath the City of Ooze is a unique combination of picture book and comic book. It will be accompanied by a teacher's guide, poster, temporary tattoos, activity sheets, E.A.R.T.H. identification cards, and more.

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Her name is Blonde. Jane Blonde.

Her name is Blonde. Jane Blonde. Jane is a worm, but not your ordinary, run-of-the-mill, fish-bait sort of worm. She's a Secret Agent Worm.

Jane Blonde, also known as Agent 009, is one of the leading agents for the top-secret, underground organization known as E.A.R.T.H. or **E**spionage **A**gents with **R**eally **T**errific **H**air. Her partner is none other than that dapper devourer of dirt, Napoleon Soil, better known as Agent 001.

Like all good secret agents, Jane Blonde and Napoleon Soil are on a mission that is both daring and difficult, but not impossible. Their mission is to infiltrate the brains of grade school kids—specifically, those from third through fifth grade.

It takes a lot of planning and execution to sneak by the defenses of a grade school student. But that is precisely the goal of our Secret Agent Worm project, which was developed at the University of Illinois with funding from the Illinois Environmental Protection Agency through 319 Clean Water Act money.

Hopefully, some of the lessons we learned in our quest to infiltrate the brains of 8- to 12-year-olds will apply to similar missions of your own.

The Boredom Barrier

In the hey-day of the Cold War, the Berlin Wall symbolized the barrier between West and East, cutting off the free movement of information and ideas. However, our intelligence reports have revealed that a similar wall separates teachers from students, cutting off the free-flow of information. That wall is Boredom.

I call it the Boredom Barrier. In other words, many students are too bored to let any information slip past their defenses and into their minds.

What I would like to do is divulge some of our top-secret plans to get past this barrier and deliver information about nonpoint source pollution. We are attempting to go behind the lines, so to speak. And our primary strategy is—Sneak Past Their Defenses.

Sneak Past Their Defenses

One of the most daring attempts to sneak past the barriers separating West and East Berlin was the construction of an underground tunnel beneath the city. In 1954, the Americans began digging a 500-yard-long tunnel, beginning in a building disguised to look like a radar station. One year later, the tunnel made it possible for the allies to tap into underground cables that the Soviets used to carry sensitive information.

Sneaking past their defenses also happens to be an ideal strategy in reaching grade school kids. One of the best ways to sneak through the Boredom Barrier is by making your lessons exciting, fun, and just plain zany. By doing this, kids wind up learning, and they do not even suspect a thing.

By making a lesson fun and exciting, it is often assumed that this means you cannot deliver substantive information; it means you dumb down the lesson and strip out all of the real information because, after all, that is the boring bit. But that is not what I am talking about. With the Secret Agent Worms, we did not remove a single piece of information that we would have included in a more straightforward approach to teaching about nonpoint source pollution. We tried to include everything that a fourth-grader would have encountered in a chapter on soil erosion in a standard textbook.

You might say that we disguised our textbook to look like a comic book. The two books around which our project revolves are: *The Disappearing Earth* and *Beneath the City of Ooze*. They both have an obvious comic book look.

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In each of these books, Jane Blonde and Napoleon Soil are on a mission. In *The Disappearing Earth*, they are trying to find out why our soil is disappearing. In *Beneath the City of Ooze*, they are trying to find out why Sparkle Lake is being polluted. But, the Secret Agent Worms are not known for their brain-power. In both cases, Napoleon and Jane believe the culprits are evil agents from M.U.D. (**M**ean and **U**nfriendly **D**oofuses). Only their wise grandfather, who joins them on their missions, knows the truth. It is through the grandfather that the reader learns what is really happening to our soil and stormwater.

However, as I said, we did not scrimp on technical information just to make it fun. For example, *Beneath the City of Ooze*, includes an array of information on stormwater runoff:

- The differences between sanitary sewers and storm sewers.
- How storm sewers work.
- The different types of contaminants that can move with stormwater runoff.
- Ways that *individuals* can reduce the risk of pollutants moving into storm sewers.
- Ways that *cities* can reduce the risk of pollutants moving into storm sewers.

But, how exactly did we make this kind of information fun? In sneaking past their defenses, we followed several key principles:

1. Smuggle the message past the Boredom Barrier through a story

It is no wonder that the novel is the most popular form of literature. The reason is very simple. Life is a novel. Life is a story.

That is also why I believe that stories make the best vehicle in which to slip in science lessons unnoticed. In fact, I am surprised the strategy is not used more often. One nice example of this approach is *Sophie's World*, a book about philosophy. Rather than presenting a dry, deadly dull recitation of philosophical principles, the author presented these difficult concepts through a story that had a mystery

running through it. This book, in fact, was developed by a teacher for his class before it became a best seller.

Our inspiration for taking the story approach was *The Magic School Bus*, the wildly popular science book series. In each adventure, Ms. Frizzle takes her class on a wacky field trip to unbelievable places—like outer space, the inside of the human body, or the inside of a volcano, to name just a few.

The Magic School Bus tells a story. So do the Secret Agent Worms.

2. Go for "cool," not "cute."

As I mentioned earlier, our primary target age level was third through fifth grade. And at this age level, anything that smacks of "cute" is going to gag some of the readers. So that is why we went with "cool" secret agents.

I do a lot of writing for VeggieTales, and my editor has consistently said that one of the biggest problems she sees in submissions is that writers go for “cutsiness.” But, that is not what the VeggieTales people are looking for. Just because their characters are cute vegetables, that does not mean they are looking for Precious Moments stories. They would rather deliver their life-lessons by using a Batman-style superhero with supersuction plungers on his ears. A superhero like Larryboy.

One of the major advantages of taking the "cool" approach is attracting boy readers. I have heard continually, from both book editors and science teachers, that the biggest problem is attracting the boys. Girls will read books that are tailored with boys in mind. But, boys are not likely to pick up books tailored for girls, teachers say. And I have found this to be true. When I take the Secret Agent Worm materials on the road, the girls are nearly as enthusiastic about the secret agent theme as the boys.

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3. Aim for high-level materials.

Our third strategy in sneaking past the Boredom Barrier was to aim for visuals that can compete in today's youth marketplace. In delivering information to youth, we are up against Disney, Pixar studios (the makers of “Finding Nemo”), Nickelodeon, and more. Kids today are used to sophisticated visuals. So, putting out a full-color book with cutting-edge illustrations was extremely important.

As an example of the high-level we are going for, our illustrator Brian Cook did something in *Beneath the City of Ooze* not often done in children's books today. He mixed cartoons with real-life images--an innovative technique that Brian likes to call RealToons. In one of the two-page spreads, for instance, he used the photograph of an actual soup can. In another two-page spread, our cartoon worms navigate their way through a real city created from a collage of photos that Brian took in Chicago. (Getting this street-level shot on a busy Chicago street was a dangerous mission worthy of James Bond himself.)

Although high-end visuals were our goal, we were selective in our use of them. The Secret Agent Worm project also includes a teacher's guide, but we did not feel that this guide called for full-color illustrations. As a result, the teacher's guide was printed black-and-white, without a lot of expense on the design end of things.

Thanks to EPA funding, we managed to keep the price for our books reasonable and competitive—$6.50 per copy. But, one thing I learned during our first project was the need to also offer some simple, freebie items for kids. Even with our reasonable prices, I still felt like we needed free items to serve as just another vehicle to deliver the nonpoint source pollution message of the Secret Agent Worms.

To meet this need, I recently developed a small packet of materials on wells. It includes illustrations, an experiment, and a brief two-page story featuring the Secret Agent Worms. The story is a text-only story, not a comic, so it did not require fancy visuals.

In addition to putting out the water quality message, these free items provide another way to promote the Secret Agent Worm project. I hope to put out a freebie packet of information once or twice each year.

4. Action heroes demand action—hands-on action

Finally, I come to our last strategy in sneaking past the Boredom Barrier—hands-on action.

It is no secret how people learn most effectively. We learn by doing. According to University of Illinois research, if all we do is hear information, we typically retain 25% of it. If a teacher demonstrates what is being taught, retention rises to 45%. If students follow the demonstration by doing it themselves, they retain about 75% of the information.

That is why we decided to develop a series of hands-on activities to supplement and support the two Secret Agent Worm books.

For each of our books, we have a teacher's packet and a hands-on science kit. The teacher's packets include a teacher's guide, stickers, temporary tattoos, secret agent identification cards, activity sheets, posters, and copies of the adventure books. The science kit includes a teacher's packet, plus all of the supplies to conduct four experiments.

Although the books, *The Disappearing Earth* and *Beneath the City of Ooze*, are aimed at third- through fifth-grade readers, the activities in the teacher's materials reach an even wider audience. I have conducted these activities for literally thousands of kids over the past few years, from kindergarten through sixth grade.

Of all of the experiments and activities in the two projects, I think the one that best captures the spirit of the Secret Agent Worm approach is our stormwater table. This activity incorporates some zany elements, but none of the educational content is sacrificed. Essentially, this table is a slightly nuttier and much cheaper version of the Enviroscape models.

Our teacher's guide describes several extremely cheap ways to create small city landscapes. But, it also describes how to make a more elaborate stormwater table, which is still cheaper than the Enviroscape models. For our purposes, we use this more elaborate, 6-foot by 5-foot wooden table, hinged in the middle. On this base, we build a city—the City of Ooze. Initially, I considered creating a realistic city to scale. But, I realized that it would be more fitting with the whimsical spirit of the project, not to mention cheaper and easier, to simply build the city using toys from the local Toys-R-Us.

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The result? The City of Ooze includes a neighborhood made out of Polly Pocket houses, a Matchbox police station and construction site, a Hot Wheels roadway, skateboard ramps, train tracks, a Jurassic Park compound, and all kinds of cars and figurines, from gorillas and dinosaurs to Batman and Spongebob Squarepants.

With this table, students apply four pretend contaminants—powdered fruit drink mix as pesticide, cake crystals as fertilizer, cocoa mix as manure, and soil…as soil. Of these contaminants, the kids' favorite by far is the manure. You see, in the City of Ooze, there are no dogs. The people of Ooze keep dinosaurs as pets. Therefore, I have the kids take a toy dinosaur for a walk through the city. Wherever the dinosaur stops, another student leaves a big heaping scoop of cocoa mix manure.

After placing contaminants on the ground, students apply rainfall using Nalgene plastic bottles with holes in the lids. The runoff water picks up the contaminants, flows into a storm drain, and then moves into our PVC pipes, which represent the storm sewers. Finally, the polluted runoff flows straight to our lake.

This experiment clearly and dramatically demonstrates how contaminated runoff water can flow through our storm sewers directly to a lake, without going through any treatment process.

I have consistently found this experiment to be loads of fun for the students. But for actual data, I refer to a Conservation Day that I did in Christian County, Illinois, in May of 2003. Of the 165 students who rated all seven activities at the Conservation Day, 123 rated the City of Ooze the highest—a number 1 on a scale of 1 to 5. The next closest activity at the Conservation Day had 75 number 1 ratings.

When asked to write down what they liked most about the Conservation Day, 70 of 192 responses named the City of Ooze--more than any other activity at the event. The next closest activity received 24 votes.

What have we learned?

After doing Secret Agent Worm experiments with thousands of kids, writing and developing two books, two teacher's packets, and two science kits, I feel that we have the development and production side down well. We have high-quality materials, and we have used our resources well—putting the most money into products that actually wind up in the hands of youth.

What we have learned over these two projects, however, is that a greater emphasis over the next couple of years needs to be on marketing and promotion. Central to this is the need for a Web site presence. When our first book and set of materials came out a few years ago, we received some effective television exposure and print promotion. But, after that short-lived flurry of publicity, the main way we received exposure was word-of-mouth through our Extension system and my occasional forays into the field with experiments. But, we need more.

A Web site will go a long way to remedying this need for greater exposure. That is why the EPA is funding another two-year project--this one to develop an interactive Web site. The Web site will be both a marketing tool and an educational tool. The site is in the early idea stages, but it will provide kids a chance to explore the top-secret headquarters of E.A.R.T.H.; as they move through Secret Agent Worm headquarters, they pick up all kinds of information on nonpoint source pollution.

Once again, this will be a resource that gets our greatest amount of financial and creative resources, since it will be used directly by the kids themselves. We are aiming for a Web site that includes flash animation and interactive features similar to what you might find on top-of-the-line youth Web sites, such as Nickelodeon or Disney.

In addition to the Web site, we will continue to publicize the materials through news releases and radio and television spots—strategies that we used before. But, we also hope to get greater marketing exposure through the new freebie items that I mentioned earlier.

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Diversifying Your Intelligence Operations

Nonpoint source pollution is not the kind of subject that is apt to excite kids. Even the name is rather imposing to a fourth grader. That is why it is urgent to come up with exciting strategies to sneak past the Boredom Barrier. And like any good intelligence operation, we need to come at the problem from a variety of angles—from full-color books, tattoos, and teacher's guides to short stories and interactive Web sites.

But, even then, there are no guarantees, just as there are no guarantees in the real world of espionage. In the case of the Berlin Tunnel, Western allies were able to read information passing between the Soviet Union and East Germany for 14 months. But, in April 1956, a little over a year after the tunnel was completed, East German engineers dug up the telephone cables for repair after heavy rains damaged them. In the process, they were shocked to discover the tunnel.

The tunnel was closed, so the allies had to resort to other means to get the job done. And that is a little bit like what we are dealing with here. To successfully slip past the Boredom Barrier, we have got to be willing to come at it from all angles—with everything we have got.

By diversifying our approach, we are confident that, one way or another, our information is slipping past this imposing barrier and squirming its way into the minds of fourth graders.

Or should I say, “worming” its way in?

Project "SIGNS": Increasing Watershed Awareness through Signage and Public Education

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Abstract

A coalition of southwestern Ohio organizations recently implemented a pilot watershed signage program accompanied by a media-based public education effort, intended to raise local awareness about watersheds and nonpoint source pollution and to encourage greater stewardship of local water resources. The group also hoped to demonstrate the effectiveness of the educational campaign through use of surveys and to develop a program that could be replicated elsewhere. Pre-installation surveys were distributed in December 2001 to 1,000 randomly selected residents to establish a baseline. The public education phase began shortly thereafter. In March 2002, watershed signs were installed at 20 stream crossing locations, and local print media covered the event. One month later, follow-up surveys were mailed to randomly selected residents. Analyses of survey responses revealed a statistically significant increase in the percentage of respondents who identified the correct answer to six survey questions between the two surveys. Project partners have since received continuing positive verbal feedback from local residents and officials. Successful implementation of the project has served as a catalyst for a much larger regional campaign to be implemented soon in multiple counties in southeastern Indiana and southwestern Ohio.

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Background

In late 2001, the Ohio Environmental Protection Agency awarded an Ohio Environmental Education Fund mini-grant to the Mill Creek Watershed Council, a nonprofit organization located in Cincinnati, Ohio and member of the Watershed Signage Group of Southwest Ohio (WSGSO), to conduct a watershed signage and awareness demonstration project. The WSGSO, a subcommittee of the Hamilton County Wet Weather Initiative, included representatives from the Soil and Water Conservation Districts of Hamilton, Butler, Warren, and Clermont Counties; Mill Creek, Little Miami River, and Great Miami watershed organizations; the Greenacres Foundation and the Hamilton County Engineers Office. The project was part of a larger regional effort, now known as Project SIGNS (Signage Inspires Great Neighborhood Streams), being conducted by representatives from multiple county agencies and stakeholder groups to create a coordinated and consistent watershed signage program in the southwestern corner of Ohio. The demonstration project began in late 2001 and was completed in the spring of 2002.

Study Design and Implementation

Goals

The watershed signage and educational outreach demonstration project had three primary objectives:

1) To increase the public knowledge level about watersheds and nonpoint source pollution through creation and implementation of a public awareness program,
2) To demonstrate the effectiveness of the program through use of surveys, and
3) To develop a program that could be replicated elsewhere.

Through consensus among project partners, it was decided that the group would create a watershed signage program in one community in southwestern Ohio that would be accompanied by a media-based, public education effort to raise local awareness about watersheds and nonpoint source pollution and to encourage greater stewardship of local water resources.

Study Location

Colerain Township, located in Hamilton County, Ohio, was selected as the target area for this project using the following criteria:

1) Large geographic area – 44.5 square miles (maximized opportunities for locating signs),
2) Large population – over 60,000 people (involved large target audience),
3) More than one watershed – study area contained portions of two of the region's largest watersheds (provided opportunities to test retention of sign information),
4) Multiple land-use types – included both rural and urbanized areas (incorporated different resident behavioral patterns and driving conditions), and
5) Local support – involved community officials who were willing to participate.

The large study area included all road types and many possibilities for sign locations, which was helpful when some locations proved infeasible. The large target audience offered more opportunities for people to see the watershed signs and read the educational materials. Differing demographics in the eastern versus western portions of the township provided a wide range of potential target audience types. Established urban areas, with both residential and commercial land use, dominate the eastern half of the township. The western portion is predominately rural areas rapidly being converted to high-end residential. Colerain Township administration and staff proved to be integral partners in developing the grant application, designing the study, and providing manpower and equipment for the sign installation event. The township also paid some of the printing and postage costs associated with the surveys.

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Watershed Signage Program

Development of the watershed signs began prior to the start of the demonstration project. The process was defined and refined by working through a series of critical decisions. The first key question was, "Do we install watershed boundary or stream crossing signs?" Both have been implemented elsewhere in the country but, at the time, not in Ohio. It was eventually agreed upon that stream crossing signs were more appropriate for our area as we were attempting to educate local residents and promote stewardship of local streams. An important factor in reaching this decision was that watershed boundary signs are often placed on interstates, where the target audience is not necessarily local.

The second critical question dealt with sign location. Signage on freeway and highway overpasses would reach a larger audience on a day-to-day basis. However, many of these individuals would be passing through relatively quickly. This introduced uncertainty as to the educational effectiveness of a watershed signage program that had a target audience traveling at greater than 50 miles per hour. Another limiting factor was the Ohio Department of Transportation's general reluctance towards allowing watershed signs on interstates and state "numbered" roadways. Signs on county and local roads, on the other hand, would reach fewer people on a daily basis, but would be seen more often over time as people traveled throughout their community. Since the group agreed that the study's target audience consisted of local residents, signage at stream crossings on local roads would be more suited for the project. From a practical standpoint, it was also easier to obtain permission to install signs from county agencies and local municipalities versus the state transportation department.

Stream crossing sign locations were identified through in-house mapping exercises by committee members, followed by field checking to eliminate locations that were not feasible due to lack of perennial stream presence, poor visibility, physical obstacles and obstructions, and light traffic patterns. Final adjustments to sign locations were made after buried utilities were identified and marked. All sign

locations were in either county rights-of-way or on township property. Having the County Engineer's office and the township on board as project partners simplified the approval process for sign installation.

The remaining decisions related to the actual sign design. In keeping with the goals of the overall watershed awareness project, the signs would have to serve multiple educational purposes: identification of the watershed by name, identification of the stream being crossed, and inclusion of a stewardship message. In addition, the sign would have to be eye-catching to attract the attention of local residents. All this needed to be conveyed with as little wording as possible to keep the sign legible for passing motorists.

The final sign design included two distinct parts: a larger watershed sign with a distinctive, appealing logo and a smaller stream name sign. The individual watershed name is identified at the top of the larger sign and the stewardship message, "Keep it Clean!" is printed at the bottom. The logo, designed by the project partners, is the same on all signs, lending the project consistency across a wide geographic area and creating a recognizable and memorable icon in the minds of the local residents. The smaller stream name signs could be expanded in width to accommodate longer stream/river names. This format provides flexibility with regards to use in multiple watersheds and simplifies sign production. The signs were designed to be mounted on standard U-channel, steel posts that could be driven into the ground or attached to existing bridge abutments.

Sign Installation

On March 1, 2002, project partners and volunteers installed 38 watershed signs at 20 stream and river crossings in both urban and rural areas of the Mill Creek and Great Miami River watersheds within Colerain Township. All signs went in at the same time to make the largest possible initial impact. Sign locations included both county and township roads. Each of the selected stream crossing locations now sports a large sign that contains the name of the watershed, the "Keep it Clean" message, and a watershed logo. Separate, smaller signs identifying the stream name were installed below the larger watershed sign. Local newspapers were contacted prior to the event and were present to photograph the sign installation process and to interview volunteers.

Watershed Awareness Campaign

Educational Program Design

Graduate students from the Miami University (Ohio) Institute of Environmental Science (in collaboration with other project partners) designed a program to familiarize local residents with the watershed(s) in which they live, work, and play, and to teach them about basic watershed concepts, nonpoint source pollution, activities that impact local water quality and simple best management practices (BMPs) that residents can implement that will help improve water quality. Results from a preliminary survey of township residents, conducted early in the study, were used to establish a knowledge level baseline regarding the above topics in the target community. More information on the survey is contained the "Project Effectiveness" section of this paper.

BMPs selected for inclusion in the campaign needed to be simple to understand, easy to implement, and cost-free or inexpensive. The behaviors, BMPs, and educational messages that were ultimately incorporated into the educational materials are presented in Table 1.

Table 1. Educational messages for watershed awareness campaign

Apply fertilizers and pesticides only when needed and after it rains.	Rather than …	Over-applying fertilizers. Whatever is not absorbed will just wash away into our creeks.
Wash the car on the grass, not the paved driveway.	Rather than …	Washing the car on the pavement. Soapy water can flow into storm drains and our creeks.
Compost yard waste or dispose of it with the trash.	Rather than …	Disposing yard waste in the creek. Yard waste can also be a surface water pollutant.
Dispose of dog waste properly.	Rather than …	Leaving dog waste on the ground. It will end up in the storm drains and our waterways.

The number of BMPs was also kept low, so as not to overwhelm the target audience with new information. This also simplified creation of educational materials.

Creating educational materials that would increase overall knowledge and encompass all of the above objectives and information in a succinct, interesting manner within the time and cost constraints proved somewhat problematic. The educational media used in the demonstration project were selected based on five criteria: responses obtained from questions in the preliminary survey, a literature search on related topics, experiences of other organizations in the United States, advice of township administrators, and budgetary and time constraints.

Responses from a preliminary survey indicated watershed signs, newsletters, and pamphlets were the educational material types preferred by township residents. Local newspapers were used after consulting with Colerain Township officials, who related past successes (and failures) of public education in their community. We contemplated alternative ideas for distribution of educational materials, including community workshops, newsletters, and cable television. Newsletters and workshops were ruled out due to timing issues and expense. Township administrators also stated that past educational workshops on other issues had not been well attended. In the end, the primary educational elements of the study included the stream crossing signs, newspaper articles, and a two-sided educational flyer complete with maps, graphics, information about nonpoint source pollution, and suggested BMPs.

Implementation

Between November 1, 2001 and June 30, 2002, project partners implemented a watershed awareness program that included educational articles and columns printed in local papers, sign installation, news articles covering the watershed sign installation event, and 17,000 watershed awareness educational flyers distributed to the target area as a separate insert in the local community press. Carefully crafted press releases were an effective and efficient means of generating media interest.

Project Effectiveness

Survey Design

Two written surveys were developed by the Miami University graduate students to assess the effectiveness of the public education effort and the watershed signage program in raising the watershed knowledge level among local residents. Both surveys were also intended to provide feedback regarding the types of educational materials the residents would prefer to receive, as well as whether they saw any of the media used, including watershed signs. The surveys consisted primarily of closed-ended true/false or multiple-choice questions. Several open-ended questions were included at the end of each survey to allow the respondents an opportunity to report their reactions to the stream crossing signs and to comment on the watershed awareness program. The survey design and questions were evaluated and refined after a series of draft surveys were administered to university students and professors, as well as Colerain Township staff.

The questions on the first survey, mailed to one thousand randomly selected residents in December 2001, were designed to determine the baseline level of watershed awareness. A second survey, mailed to one thousand randomly selected residents in late March 2002, was designed to assess the level of public awareness about watershed issues after the signs were installed and the public education effort had been completed. Cover letters on university letterhead introduced the project to survey recipients and encouraged them to participate. A follow-up reminder postcard was mailed one week later to survey recipients. Local newspapers also carried brief articles alerting residents to the upcoming survey and urging residents to respond if they received a survey.

A separate signage survey, distributed in March 2002 to one thousand randomly selected residents after the watershed signs were installed, consisted of a perforated postcard containing three questions: Had they seen the pictured watershed sign? Where did they see the signs? What did the sign mean to the resident? This smaller survey was intended to help assess whether the sign locations themselves were effective.

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Survey Results

Responses to questions in the first survey indicated that over 50% of township residents could correctly define and identify point source and nonpoint source pollutants. Fewer than half, however, could define a watershed or name the watersheds or streams in their community. Most could not identify the communities that were upstream and downstream of Colerain Township. They, for the most part, did not know that water collected in the storm sewers was discharged, untreated, to local streams. They also had difficulty identifying potential sources of pollutants that threaten their waterways or watershed. Respondents to the second survey demonstrated a good understanding of basic watershed/pollution topics and could define and identify point source and nonpoint source pollutants. The majority still had difficulty with questions specific to their township. Fewer than half were able to identify specific streams in their community and define/identify their watersheds.

However, statistical analyses of both sets of survey responses performed by the Miami University graduate students revealed that there was a statistically significant increase in the percentage of respondents that identified the correct answer to five questions related to the project goals between the first and second surveys. Importantly, more people were able to identify which watersheds are located in Colerain Township and could identify behaviors and activities that have a negative impact on water quality. Table 2 summarizes these findings, including the survey questions and associated statistical data.

Table 2. Summary of survey responses showing statistically significant improvement

Survey question	S1–% Correct	S2–%Correct	X^2, (p-value), [% inc]
Septic tanks leaking into a nearby creek will pollute the water. (T/F)	91	98	6.6, (0.01), [7%]
Improper disposal of dog waste can affect water quality. (T/F)	60	73	6.07, (0.01), [22%]
Removing vegetation along a creek can cause soil to fall into the creek. This soil falling into the creek is a pollutant. (T/F)	42	56	6.16, (0.01), [33%]
Which watersheds are found in Colerain Township?	9	18	5.30, (0.02), [100%]
Which issues may affect water quality?	45	60	6.94, (0.08), [33%]

The study also revealed that the preferred mode for disseminating educational materials about watersheds was through watershed signage, a result that had significant implications for the Project SIGNS regional watershed signage program. Newsletters and pamphlets were the second and third choices, respectively. Table 3 identifies the residential preferences for types of educational materials.

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Table 3. Residential preferences for educational materials

Educational Material Type	Percentage of respondents*
Watershed signs	85
Pamphlets	25
Newsletter	43
Advertisement	9
Sign	12
Email	4
Other	6
* Survey respondents could select more than one answer.	

A separate analysis prepared by the Miami University students suggested that the watershed awareness program may have been more effective if the frequency of resident exposure to educational materials were increased, and if more time had been permitted to pass between installation of the signs and distribution of the second survey.

Conclusions

The Colerain Township watershed awareness education and outreach program was successful in meeting all of its stated goals: increased watershed awareness, demonstrated effectiveness of a signage and education campaign, and development of a program that can be easily replicated.

Watershed Awareness
The demonstration project results reinforced the belief of the Project SIGNS group that a public awareness campaign that incorporates watershed signage and educational outreach is a viable means of increasing the public knowledge level about watersheds and nonpoint source pollution. The stream crossing signs placed in twenty locations throughout the township will remain in place indefinitely as a reminder to the more than 60,000 residents that they live and work in a watershed, and that they should keep it clean. The township will also be able to use this signage and public education program to help meet some of the public education and outreach requirements of their Phase II Stormwater permit.

Effectiveness
The watershed awareness campaign was proved effective through the use of carefully designed surveys administered before and after watershed sign installation. Statistical analyses of the survey results revealed increased awareness related to key objectives of the project: identification of local watersheds and behaviors and actions that can impact local water quality. A relatively large sample size (1,000 recipients) was incorporated into the study design to enable detection of increased public knowledge levels. Inclusion of a cover letter on university letterhead may have lent credibility to the survey effort, though this was not specifically tested.

Replicability
The program, as designed, can be easily replicated elsewhere. The project partners created a generic watershed sign that can be used in any watershed, simply by changing the watershed name. The fish logo and the "Keep It Clean" message are universal. The watershed sign can also be used at watershed boundaries should an organization choose to proceed along those lines. The intentional placement of the stream name on a separate sign located below the watershed sign makes the signs easily adaptable to any situation. The survey structure and method of distribution are also universal. Some modifications would be required for survey questions that contain geographically specific information. The survey letters and follow-up postcards were also useful tools that could be replicated by any organization. The watershed awareness educational flyer could be adapted to other watersheds by incorporating the appropriate geographic information.

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Lessons Learned

Some of the more important lessons learned during the course of the project include:

1) A watershed awareness program takes a tremendous amount of cooperation and effort from those involved. The exclusion of any of our project partners may have resulted in an unsuccessful project.
2) A signage project cannot be done without the cooperation and consent of the local political jurisdictions involved. Each stream crossing location must be approved by the relevant political jurisdiction.
3) Involving reporters from the beginning increases the likelihood that the project gets the publicity needed for a program focused on public awareness. A writer from The Northwest Press, a community-based paper, was contacted early in the process, and she followed the project through from start to finish. We were less successful with larger, regional papers.
4) The logistics of installing signs was more complicated than was anticipated. Each jurisdiction has very specific requirements regarding sign height and placement. Sign installation logistics are further complicated when affixing signs to different objects: separate posts, guardrails, or utility poles.

5) Volunteers do not always show up as promised. Plan on having a dedicated group of individuals to carry the project through.

Next Steps

Project SIGNS intends to use information generated from this project to obtain support and funding for a regional watershed signage effort that will eventually cover much of the southwestern corner of Ohio and extend into southeastern Indiana. This effort will be accompanied by a public education campaign that is expected to include billboards, public service announcements, media involvement, newsletters, Web sites, and a magnet/bookmark campaign in local schools. Local communities and businesses will be solicited to assist in funding and implementing this larger project.

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Take the "Florida Yards and Neighborhoods" Program and Call Me in the Morning: A Cure for the Environmentally Challenged Landscape

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Abstract

Most environmental education programs do not have the funding to put large amounts of money into an advertising campaign that would make it competitive with all the other products or services vying for the public's attention. In the age of the sound-byte, catching the public eye and keeping it is not an easy thing to accomplish. Environmental programs need to be innovative, educational, and positive; they need to draw the public into the role of active participant instead of just a passive learner. The Florida Yards and Neighborhoods (FYN) program at the University of Florida has been successful at doing just that.

The FYN program has grown from a grass-roots environmental education movement for sustainable landscaping into a statewide program that protects natural resources by reducing nonpoint source pollution in the landscaping arena. Nine basic principles and their practices approach the landscape and its maintenance as a holistic system. This program relies upon the conscious and voluntary behavioral changes on the part of the participant. Stakeholders are encouraged to adopt sustainable practices in their landscaping design and maintenance, and are rewarded with various positive and reinforcing "strokes" that keep them involved in the program. Programmatic team leaders search for any and all methods that will enable them to teach FYN in a positive environment, leaving the participant with a desire to make a difference in their own backyard.

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Objectives

The main objective of the FYN program is to educate participants on how to develop and maintain landscapes in such a way that they impact the environment as little as possible. Valuable natural resources are put at risk everyday based upon the decisions that are made in the landscape. It has been documented that certain landscaping practices contribute to many different forms of air, noise, and water pollution. The FYN program is attempting to change the behavior of participants by teaching them alternative forms of design and maintenance practices that they can adopt in order to create and sustain a landscape that is more ecologically in step with the surrounding environment.

Information and education alone will not influence most participants to change their behavioral actions that they have learned over a long period of time. The key to programmatic success for FYN is to conceive and nurture the sense of responsibility that people must have for the protection of their natural resources. Participants will usually not change their behavior, even with incentives, if they do not feel personally involved, responsible, or attached in some way.

The Nine FYN Principles

The scientific backbone of the FYN program is its nine principles and their related actions and/or activities that a participant can incorporate to develop a more sustainable landscape, thereby reducing the impact of the landscape on the environment. Although water conservation is an important issue, the FYN program approaches the landscape in a holistic fashion, realizing that it is just a small eco-niche within the environment as a whole. One of the most difficult concepts for participants to grasp is the

concept that their yard does not just stop at the property line, but that everything that they do in their yard can affect a much greater area—including natural resources that might be miles away. Reducing stormwater runoff and nonpoint source pollution are just two of the benefits that can be accomplished when a "Florida Yard" is created, but there are many others as well. Each principle has been developed to stand alone as an educational module that will conserve and protect a natural resource, but when all nine principles are incorporated together, they create a buffering effect that results in less impact on the environment, while allowing the participant to enjoy an aesthetically pleasing landscape.

Right Plant, Right Place
This principle is the premiere concept that the other eight revolve around; if participants could learn to select the correct plant that will thrive best in a particular area then the other resulting problems would probably not occur. The main reason that landscapes require so much care and input is because the plants selected are usually not ones that will grow the best in that environment. The public is being constantly bombarded with marketing campaigns from garden centers that influence them to purchase plants based upon eye-appeal, and not necessarily what will grow well in their yard. The consumer must be equipped with the proper knowledge that will help them make the correct choice.

Water Efficiently
Research has shown that in some areas of the U.S., up to 65% of a household's water bill is for irrigation. Not only is this wasteful, but it is impractical since many states are facing shortages resulting in watering restrictions. The American public has been relatively lucky with regard to surplus water resources, but that is rapidly becoming an issue of the past. The future will only see a tightening of regulations that will limit their ability to have a landscape that is not water efficient.

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Mulching
Mulch keeps moisture in the soil and moderates the soil temperature. Applied properly, it can also help prevent erosion, suppress weeds, and add a design element to the landscape that may complement plantings. In some instances, mulch can even replace turf or ground covers in areas that are difficult to mow or maintain. Additionally, it can be utilized in areas where other plants have a hard time establishing and growing, such as in shady areas.

Recycle
In an environmentally friendly yard, grass clippings, leaves, and yard trimmings are recycled on site to add nutrients and to reduce waste disposal. The main idea is to keep most of the waste on site, instead of in the landfill. Composting of organic material is encouraged. Inorganic material can be reused in many different ways if thought is put into it. For example, an old tire can be cut and inverted and turned into a planter with the wheel acting as a stem. Painted tire planters can be made to look almost like terra cotta planters.

Fertilize Appropriately
Many trees and landscape plants need little or no fertilizer once they are established and mature. Unfortunately, due mostly to commercial marketing, the general public believes that it is necessary to fertilize multiple times throughout the year. Needless applications and inappropriate utilization of fertilizers have shown to contribute to nonpoint source pollution. In the FYN program, participants are given the proper knowledge in order to make an informed decision about fertilization for their yards. If fertilization is required (i.e., for turf grass) then a slow-release product is recommended over a quick-release one.

Manage Yard Pests
Concerns about health, the environment, and the increasing resistance of pests to chemicals have forced people to reconsider traditional pest control practices. It often surprises people that nature can take pretty good care of itself without chemical intervention. Many insects are beneficial to the environment, with only about 1% truly being harmful to plants. The problem lies with most consumers' desire to have a "picture perfect" lawn. This has been one of America's greatest fallacies with regard to landscaping and yard care. Instigating a regular Integrated Pest Management (IPM) program is more environmentally sound and helps control damaging pests overall, better than most chemical applications.

Reduce Stormwater Runoff
Water running off of a landscape can carry soil, debris, fertilizer, and pesticides that can harm water quality. Techniques that reduce this runoff help prevent nonpoint source pollution. Rain that falls in a particular area should soak into that area, and not be encouraged to runoff. Retaining rainfall long enough for it to percolate through the soil is particularly challenging in today's urban areas because of the impervious materials that we have been using on roads, sidewalks, driveways, and parking lots. The FYN program illustrates the importance of reducing runoff, and teaches participants actions that will achieve this in their own yard or landscape.

Provide for Wildlife
Providing adequate sources of food, water, and shelter can increase the number and variety of insect and animal species that help conserve biodiversity. It is important that homeowners and maintenance professionals realize how important it is to plant vines, shrubs, and trees that attract different types of wildlife.

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Protect the Waterfront
Waterfront property, whether on a bay, river, stream, pond (man-made or natural), or beach, is very fragile and should be protected carefully. A special responsibility goes along with enjoying this natural resource, and everyone needs to realize the contribution that the water system makes to our quality of life.

Advantages and Disadvantages of Creating a "YN" Program

There are many obvious advantages for developing and promoting a "YN" (Yards and Neighborhoods) program. As seen above, there is nothing so specific in the nine principles that could not be adapted for any region in the U.S. Implementation of this program can conserve and preserve natural resources, including water. It can create and maintain aesthetically pleasing landscapes that will satisfy the public, as well as protect the environment. In some instances, it can even save time, energy, and money on the part of the homeowner and/or landscape professional.

Unfortunately, there are some drawbacks to this particular type of environmental programming. It is extremely difficult to measure the impacts of the program. Although a neighborhood or community might be incorporating the FYN principles into their lawn care practices, to date, there is no accurate way to document the reduction of impact to a water system. Improvements to the environment are also difficult to quantify to the satisfaction of some people. There is a lack of scientific data supporting some of the FYN activities; logical arguments are not significant to critics who want to continue their current unsustainable maintenance practices.

Another problem is that FYN is not regulatory. Therefore, the incentive to follow sound environmental practices in the landscape is minimal and depends upon each individual person to

consciously make the proper decision. Also, the green industry might assume that a "YN" program is trying to put them out of business or somehow restrict the way that they have been doing things in the past, so they too can be extremely resistant to any kind of change. Builders and developers are also hesitant to make major changes in the landscapes because they do not have the data to show that the homebuyer would be interested in this type of modification. All of these difficulties can be worked out through the different educational approaches that the "YN" program develops for each stakeholder group.

Developing Your Own "YN" Program

Implementing a "YN" program similar to the FYN is not difficult, but it does take planning. Other states have begun to utilize the FYN model for their own "YN" program, and they can easily be found on the Web. There are ten basic steps that should be followed when beginning a "YN" program:

1) Do a needs analysis;
2) Organize with other groups that have similar agendas;
3) Inform the public of your intentions and introduce the concepts;
4) Develop your own program and strategy per your region's special environmental concerns;
5) Solicit support (financial and otherwise) from supporting institutions (i.e., University of Florida);
6) Develop and implement educational programming;
7) Evaluate impact and success;
8) Solicit for funding from other organizations that will benefit from the implementation of this program;
9) Instigate "continued" training for trainers and educators; and
10) Continue to re-evaluate the effectiveness of the program.

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Partnerships

Forming partnerships can be one of the most beneficial, yet sometimes frustrating, processes that an outreach educational program can accomplish. The success of a "YN" program is determined by the diverse partnerships that it can form with like institutions. Because "YN" incorporates the whole landscape into a complete program, it can meet the educational objectives of many different groups. Each main principle can have various supporters that will utilize the specific educational material that meets their individual goals. The important component for the "YN" program is to actually seek out these diverse groups and approach them in such a way that will illustrate to them how supporting this program will help publicize their program, as well. It is important to "tailor-fit" each approach to a prospective partner, so that they feel that their involvement is essential. Any organization that incorporates the "YN" mission can be a partner. Since nearly all groups can benefit from partnering with an environmental outreach program, partnerships can be as varied and as unique as you allow them to be. Once they have been shown how "YN" can benefit them, usually they are more than willing to donate materials or funds, sponsor programs, or supply a meeting place for seminars and workshops.

Funding Sources

There are generally four levels of funding that might be available to a "YN" program: federal, state, local, and private. In this age of shrinking budgets, it only behooves an organization to seek out funding from many different sources. There are many different types of funding, and putting the extra effort into

this area can only help to expand a program beyond its original boundaries. At the federal level, U.S. EPA has many different funding mechanisms to apply for. Most of these consist of writing a grant and can include the departments of Section 319, Environmental Education, and the National Estuary Program. The FYN program has received funding from each one of these grants in various forms. There are also national grant foundations that can be investigated and solicited for ideas.

Funding on the state level might be more reliable, since these organizations are often more interested in a project that is in their own region. Each state has various agencies that can be approached for funding support: the Department of Agriculture, Department of Transportation, water management districts, water authorities, and the state's department of the Environmental Protection Agency, to name just a few. Environmental groups (i.e., Audubon, Native Plant Society, Keep America Beautiful) that have state affiliations are also possible funding sources. Sources of support on the local level can include city and county governments, NPDES (National Pollutant Discharge Elimination System) permitting departments, local environmental organizations, and local water authorities. Some of these agencies will not have a regular funding mechanism like a grant announcement, but once you have fostered a relationship with them they often can be approached about sponsorship for particular activities and events.

Name Recognition

One of the most important things that we have learned in administering the FYN program is the importance of name recognition. Public perception and recognition is important to the success of a "YN" program. All programs within Florida that utilize our material and receive assistance from the state office are called "Florida Yards & Neighborhoods." They are required to utilize the logo that was developed for this program, and they are not allowed to deviate from the majority of the educational material. They can adapt the material to fit their special environmental conditions, but they must all utilize the FYN program in its entirety. All materials, including yard certification signs and demonstration landscape signage, have the same basic design, and it is consistent throughout the state. Deviation from this will result in statewide support being withdrawn and materials and other support being withheld. Although this may sound severe, we have learned that without consistent, quality control it is difficult to ascertain where and how our methods and message are being publicized. In the past, we have had the experience of an organization using the FYN program so that they could avoid certain local ordinances. This was not done for some higher environmental cause, but to avoid compliance with the local ordinance.

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As FYN has assisted other states in starting their own "YN" program, we only request that they retain the "YN" distinction in the name of their program. The consistency of this will help the program be identifiable throughout the U.S. as a concentrated effort. Permission is usually granted to modify the material to make it more suitable for regional efforts, and the only condition is the incorporation of "YN" into the name of the new program (i.e., Carolina Yards & Neighborhoods, Show-Me Yards & Neighborhoods).

Development of Materials

Programmatic team leaders search for any and all methods that will enable them to teach FYN in a positive environment, leaving the participant with a desire to make a difference in their own backyard. We have utilized a diverse group of educational and marketing tools to get programmatic information into the hands of the public. Materials are evaluated not only on their educative abilities, but also on

their ability to attract the attention of the public's eye. These materials can be divided into at least two categories: educational materials and promotional materials.

Educational materials
Materials for this program currently consist of a number of different educational media: brochures, folders, handbook, workbook, poster, displays, certified yard signs, videos, presentations with scripts, demonstration signage, university bulletins, and research articles. Most, if not all, of these materials can be requested from the statewide office in Gainesville. A comprehensive Web site, user protected, has been set up for the programmatic staff to download various educational materials. This is not accessible to the public, but was developed so that any staff member throughout the state could access the educational material. This limited the amount of duplication that was required by the statewide office, and allowed the trainer to select the media that was best suited to each individual stakeholder group to be educated.

Promotional materials
In order to compete with the mass-marketing strategies of product-related companies, the FYN program found it necessary to utilize some of the same techniques in order to attract and hold the public's attention. Although the materials developed had to be related, in some way, to landscaping and lawn maintenance, there were many different types of media that could be exploited. Examples of such are: mouse pads, message clicking pens, lanyards, clipboards, cloth bags, polo and t-shirts, rain gauges, paper carrying bags, etc.

Although most governmental agencies will not allow funds to be used to purchase promotional items, those same items printed with a conservation message become an educational item for an outreach program.

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Challenges

In this paper, we have discussed the various attributes of the FYN program, how to create your own "YN" program, and its benefits. This is not to say that the FYN program has not had its own challenges while evolving from a local project to a major state-level program. There are many things that could have been done differently. Hopefully, an honest examination of them can help you in the future.

Partnerships
Although a wonderful concept, working with partnerships can be frustrating. Each partner will have their own agenda with regard to incorporating the concepts of "YN," and sometimes that might be difficult to understand or to accept. Patience is the key in this situation. Knowing that open communication and a clear idea of what each partner is looking to gain from the association will help tremendously.

Funding
Another issue that is always at hand is that of funding: where, when, and how. You already have the "why," but sometimes that is not enough in order to get sufficient funding. The FYN program is actively supported and administered by the University of Florida. However, due to budget cuts, they have found it extremely difficult to supply funding for materials. Staff time has been reallocated to absorb the FYN program within the realm of regular extension duties, but finding the funding for all of the material support needed for a program of this size has been difficult. A major grant from DEP has been helpful, as well as some large sums from a few of the water management districts. On a local or regional level, you might find yourself soliciting funds from more than five different organizations that want to

contribute a small amount. Added up all together, this might well pay for the majority of your "YN" outreach program.

Accountability and research needs

People need proof; proof that something is true and proof that something is working. Both of these statements are true for the FYN program, one sometimes more important than the other. Although we know that nonpoint source pollution causes problems with water quality, some people still want to know exactly how this is true, how it happens, and how it can be prevented. They also want those facts and figures based upon scientific research and not just logical assumptions. Unfortunately, it is difficult to isolate some of the premises that have been developed for the FYN program, and I am not sure that there is a research program that exists to prove or disprove all of the premises that make up the holistic approach that the program expounds.

Supporting agencies also want an accountability that the program is working (for whatever reason they are funding it), and that their funds are not being mishandled. This involves surveying the participants to determine if they are changing their behavioral practices, if there is a reduction in pollution-loading in areas that have received educational outreach efforts, and being able to justify and account for the funding that is being utilized for the program. An accounting system must be maintained so that all funds can be identified on how they were expended.

Parent organization and maintaining momentum

Some organizations are only looking for short-term results that will give them a particular edge with regard to environmental stewardship. Although these types of agencies and organizations might make suitable partners, they are often not satisfactory as a parent agency for the "YN" program. To a large degree, the success of the FYN program can be attributed to the support that it receives from UF/IFAS extension service. This allows us to work in every county throughout the state, and it gives us a network of horticultural agents that no other program has access to except for the Master Gardener program. These agents have incorporated the FYN program into their regular horticultural activities, and can reach a large number of clientele through their other programming efforts. I think that it would be difficult to achieve similar results if the land-grant institution in your state were not involved. This is the one institution that is educational, has an existing outreach infrastructure, can offer research support, administrative leadership and financial solvency, which can bring a "YN" program to fruition.

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Conclusion

Much can be learned about environmental outreach educational programs by examining the Florida Yards & Neighborhoods program. Since its inception almost eight years ago, thousands, if not millions, of Floridians and visitors have been informed about the fragility of the state's natural resources. They also have been given the tools to help them combat pollution and resource-squandering through the educational distribution of the FYN program. Some research suggests that this education is helping to reduce the levels of fertilizer-source nitrates and phosphates. It also seems to indicate that the participants of this program are learning how to conserve water resources and increase biodiversity, beginning with their own backyard. It is hoped that this program will continue to have statewide success, as well as success in leading the rest of the country toward more environmentally friendly landscaping, which will result in sustainable living and the protection of our natural resources.

Reaching Out with Science to Help Communities Make Decisions

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Abstract

The need for information on nonpoint source pollution exists in many communities. The reasons for this need can vary, but in some cases it is related to external directives, such as mandated permitting, revision of regulations, or requirements for comprehensive planning. In those instances, the need for information can be high, but the audiences can be diverse and, in some cases, not wholly supportive of the process.

The Center for Watershed Science and Education at the University of Wisconsin-Stevens Point has been active in the transfer of scientific information about nonpoint source pollution to different audiences. Some of those audiences include very diverse groups actively engaged in comprehensive planning, lake management, code revisions, and legislative activities. Experience gained in those settings provides an opportunity to discuss variations in information needs and audience concerns.

We have divided our experience with information transfer related to nonpoint source pollution into three challenges: 1) demonstrating benefits, 2) describing trends, and 3) characterizing uncertainty.

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Introduction

Communities are seeking to increase their understanding of nonpoint source pollution and identify strategies for its remediation. The need for information on nonpoint source pollution can be great because it is difficult to understand and it usually results from a complex overlap of many activities and hydrologic properties. Understanding nonpoint source pollution is further confounded by its high variability both in time and space. Together, these factors lead to a need for nonpoint source education, but also complicate its delivery.

The need for additional information on nonpoint source pollution may be linked to a particular water quality problem or a desire to implement a specific activity, but it may also reflect an externally mandated requirement. Examples include permitting, comprehensive planning, or changes to governmental regulations. Local officials or citizen committees may be faced with evaluating management options they do not fully understand. Frequently, these officials or committees seek assistance as they educate themselves. Commonly, these groups enter with widely varying prior knowledge and opinions about the problems and the processes.

This manuscript reviews some of the "lessons learned" in developing and presenting educational material for community groups as they grapple with externally mandated requirements and develop management prescriptions for nonpoint source pollution. The scale of these activities varies. In some cases, it includes a few stakeholders engaged in lake management. In other cases, it may be town- or county-wide comprehensive planning or statewide rule revision. We have cast these lessons in the form of challenges to educators preparing for similar activities. Our hope is that in addressing these challenges, educators will better meet the information needs of their audiences and improve public participation in water resource management.

Background

The observations made in this paper are based largely on experience gained through different education efforts. Most of these activities have been specifically targeted towards information transfer to community audiences seeking to examine nonpoint source pollution. These audiences usually bring a variety of viewpoints, a wide range of concerns, and different prior knowledge to the process.

The education efforts described were developed through partnerships between individuals, organizations or agencies, and the Center for Watershed Science and Education at the University of Wisconsin-Stevens Point. The Center is a source of technical information for citizens, agencies, and communities. Increasingly, the Center is called upon to provide education and information transfer to community groups engaged in controversial issues such as comprehensive planning and regulatory revisions. Typically, the Center's role in these efforts is to provide science-based information and education to assist the local groups in making decisions and implementing actions.

Challenges

We have summarized our "lessons learned" in developing educational programs for community groups by exploring and categorizing our efforts. We have divided these lessons into three challenge areas for discussion here: 1) demonstrating benefits; 2) describing trends; and 3) characterizing uncertainty. We will examine these challenges and make observations regarding accompanying information needs.

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Challenge 1: Demonstrating Benefits

Audiences with a mixture of interests and backgrounds can have widely varying opinions about the importance of different contributors to nonpoint source pollution. As a result, making what appears to be a logical connection between activity and water quality impairment may be viewed with suspicion if we cannot address the relative magnitude of likely impact.

Evaluating the relative importance of nonpoint contributors can take a variety of forms. Common examples include the chemical and hydrologic budgets which provide an accounting of different inputs and outputs to water resource systems. These demonstrate the likely magnitude, or relative magnitude, of different contributors and suggest the likely benefit from addressing that contributor. Usually, these are designed at watershed-scales and frequently do not isolate specific locations or activities. There are other ways to demonstrate the relative importance of specific activities. For example, specific documentation of a cause and effect relationship might be possible. These are less common, however, because many nonpoint source pollution problems do not allow ready isolation of specific influences. Instead, the problems represent the interaction of many variables simultaneously. Mathematical simulation models present another approach to demonstrating benefit. As described further below, uncertainty associated with the simulation should also be considered.

Making the case for the benefits of taking specific action is important. Audience members not fully supportive of the process are more likely to disengage if they do not recognize that the benefits accrued from particular actions justify the effort or cost expended.

There are other advantages to revisiting the evaluation of benefits likely to arise from particular actions. A fresh and detailed review of the assumptions around which the targeting of activities is based may also lead to a reevaluation of remediation emphasis. Considerable energy, time, and money can be expended on activities that might be related to water quality, but are not going to meet long-term goals even if they are fully implemented.

Care should also be taken to prevent excluding apparently insignificant nonpoint source contributions. The possibility of future reevaluation, and the likelihood that other realities may prevent complete implementation of remedial efforts suggest that education efforts should include discussion of

as many sources of nonpoint source pollution as possible, and continue updating their relative importance.

Challenge 2: Describing Trends

Technology transfer and education to describe natural resources provide many opportunities for examining complex ecological relationships. While these make interesting education programs, some audience members will likely demand an assessment of how a particular aspect of a resource is changing over time. Answering the questions "Is it getting better?" or "Is it getting worse?" may be significantly constrained by available data and the noise inherent in measurements made in most natural systems. It may also be limited by an incomplete understanding of the variables controlling system response. However, early recognition that some audience members will be requesting information on the trends that might exist can be used to tailor future monitoring or to develop educational materials that include such considerations.

Even when initial examination suggests no immediate trend, there may be benefits, both scientific and educational, to careful scrutiny of data. While during the development of an educational program you may feel that the evidence of cause and effect is obvious, trend data provide an opportunity to test such a hypothesis, and exploring likely explanations for trends, or their absence, may lead to additional insight into the natural resource system.

Trend evaluation can be challenging. Measurements or observations made about complex natural systems may contain substantial variability arising from influences (e.g., seasonality, turbulence, flow conditions, etc.) other than those through which we are examining the trend (e.g., time). The magnitude of this variability can increase the amount of data required before trend identification is possible. Considering the variation typically encountered in natural system monitoring, this period can be substantial. For example, for trend determination from Secchi depths measured in Minnesota lakes, at least ten years of monitoring has been recommended (Minnesota, 2003).

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A more subtle influence on the trend evaluation is the systematic variation over time at intervals less than that through which we are determining the trend. For example, phosphorus concentrations in surface water will often vary systematically during the year due to changes in species succession, mixing, internal loading, and externally varying sources of phosphorus. These act in concert and result in phosphorus concentrations falling and then rising during the season. Inattention to the times of year during which samples are collected can confound attempts to determine long-term trends.

Challenge 3: Characterizing Uncertainty

There is uncertainty associated with most of the information used in water resource evaluation and management. Finding ways to characterize this uncertainty and then communicate its implications remains a substantial challenge to most education efforts. This can be particularly important in working with varied, community audiences.

Uncertainty takes many forms. It can be viewed here as the difference between the anticipated and the actual. It is a discrepancy arising for many reasons: we are using information from the past to project into the future; sample collection and analysis have some uncertainty associated with them; natural systems have numerous feedbacks and feed forwards which we only partially understand; limited budgets and short monitoring time frames preclude exhaustive system characterization; and the mathematical constructs that we use to simulate the natural systems have variability in parameter estimates translating into uncertainty in the model output.

A recent study of water resource evaluation emphasizes the importance of incorporating uncertainty in our evaluation of water resource systems (NRC, 2001). Incorporating uncertainty provides several benefits. First, acknowledging what we do not know, in addition to what we do know, can increase our credibility. Audience members bringing varied and considerable prior knowledge will likely have

different responses to uncertainty. In contrast to neglecting uncertainty, recognition and discussion of its causes and its implications can also provide opportunities to incorporate a greater process understanding. Including uncertainty explicitly in our educational efforts provides an opportunity to discuss the many variables influencing nonpoint source pollution.

Uncertainty can also become important during the use of complex mathematical models to simulate the behavior of natural resource systems. Uncertainty associated with the model inputs translates to uncertainty in model outputs. Educators and others should be careful that they appropriately view the output from complex model simulations (Reckhow, 1999; Jakeman and Hornberger, 1993).

Summary

Transferring technical information to assist communities in making decisions about nonpoint source pollution presents special challenges. The audiences in these settings can bring a variety of prior knowledge, beliefs and attitudes about the process, and they can have substantial information needs and interest in the details. Because natural resource systems in general, and nonpoint source pollution in particular, can be complex, the juxtaposition of audience needs and information availability can be challenging.

While there are numerous ways to meet the interests of community audiences seeking information for nonpoint source decision-making, we have assembled some of these into three areas for educators to consider: 1) demonstrating benefits; 2) describing trends; and 3) characterizing uncertainty. Consideration of these challenges during the development of educational efforts may encourage greater audience involvement in the transfer of information and improve water resources management.

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All I Want to Know…Is My Program Successful?

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Abstract

After developing a brochure, an outreach program, or an exhibit, a key question we ask is whether our efforts have been successful. In order to determine success, we need to have some idea of what success looks like. For example, is it enough for a program to be popular, or does it need to change the world? Who are we accountable to? Once we clarify our research questions and know what we would like to measure, we need to figure out how to do so. The good news is there are many approaches to evaluation, but the choices can be confusing.

This paper discusses some of the basics of evaluation, which should be an integral part of any project. The paper examines the definition of evaluation, together with a few fundamental steps for creating an evaluation plan, such as including the relevant players, defining goals, specifying intended audiences, and identifying how the results will be used. Different types of evaluation, such as front-end, formative, and summative will be discussed. Sample sizes, timelines, and budgets also will be described, as well as various evaluation tools, such as observations, focus groups, surveys, and interviews.

To help explain some of these concepts, a few research approaches used to evaluate the Swamp exhibit at Brookfield Zoo will be presented. This exhibit, which opened in 1996, features a southeastern swamp and an Illinois riparian ecosystem. It integrates a diverse collection of animals with a variety of interpretive techniques, including ones about nonpoint source pollution and wetlands. In addition to standard exhibit evaluation techniques, our efforts to measure the exhibit's impact on visitors' conservation behaviors will be discussed.

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Introduction

When we picked this title, we were thinking that the burning question was to find out if the program was successful. That requires clear definitions of success and the ability to conduct evaluations. After some thinking, we would add that one of the most important parts is to get funding for the program in the first place. That requires knowing enough about evaluation to create the framework for an evaluation plan. A thoughtful evaluation plan will help you build a solid program with products and impacts that can be measured, which is attractive to funders.

So, you've got a great idea that you want to move forward with; it does not matter if it is a brochure, an exhibit, a project, or a program. You have to put together a winning proposal that sells your idea, because you know funding is very competitive. Most funding agencies want the biggest bang for their buck and they, like you, want to make sure the program will be successful. W.K. Kellogg Foundation notes that when you have a clear idea, with measurable outcomes, know what you plan to do and why, and a mechanism to collect, document, and disseminate results, you strengthen your chances of receiving funds.

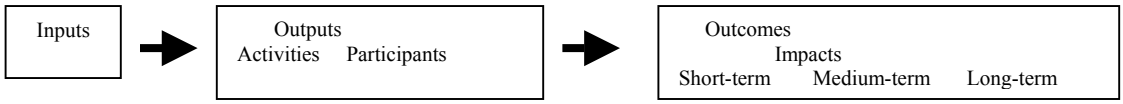
This paper is focused on the basics of evaluation, which should be an integral part of any program. We will examine the definition of evaluation, the use of logic models, and the questions to ask to formulate your plan. We will look at various types of outcomes and show how developing appropriate outcomes can help you measure your success, as well as guide your process. Finally, we will look at an example from Brookfield Zoo's evaluation of an exhibit, The Swamp.

What is evaluation?
Evaluation is an assessment process used to clarify or determine program outcomes. There is no "one best way" to do evaluation, as each situation is unique. "Good evaluation requires careful thinking through questions that need to be answered, the type of program being evaluated, and the ways information generated will be used" (W.K. Kellogg Foundation Logic Model Development Guide; 2001).

Logic Models

Many evaluation experts agree that using a logic model is an effective way to ensure a successful program. A logic model is a visual way to present your understanding of the relationships among the resources you have to operate, the activities you plan to do, and the changes or results you hope to achieve. The model makes you think more systematically, and encourages better program description and outcomes. Logic models help all along the way as you develop your program from design and planning, through implementation, to evaluation and reporting. There are some good resources regarding logic models at the end of this paper.

Figure 1. A simple logic model



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Inputs are resources such as human, financial, organizational, or in-kind contributions directed towards doing the work—what we invest. **Outputs** include activities such as services, materials, products, and actions—what we do. They can also include participants, the audience—who we reach. **Outcomes/impacts** are specific changes in attitude, knowledge, and behaviors expected as a result of the activities—what we expect as our return on investment. They can be short-, medium- or long-term.

As Yogi Berra, baseball's great catcher, once said, "If you don't know where you are going, how you gonna' know when you get there?" Good evaluation is all about asking good questions. Think about what your outcomes will be and work from there. As Beverly Anderson Parsons suggests, "plan backwards, implement forwards."

We thought it would be easiest to create a logic model to show its value in planning and evaluating your program. The following logic model is from the University of Wisconsin's Extension Service, using an example from my watershed group, Salt Creek Watershed Network. We determined our target audience (riparian landowners) and then looked at what we expected as outcomes for the program. As you walk through the steps, you'll see it's much like what you are already doing. It's not complicated. Hopefully it's clarifying.

In our example, our **desired ultimate outcome** was less sediment and pollutants in Salt Creek—a cleaner creek.

Desired long-term impacts:

- Landowners will plant streamside plants to reduce erosion and catch property runoff.
- Landowners will understand how to manage their streamside lawns without chemicals.
- Landowner will serve as a mentor for another landowner.

Desired medium-term outcomes:

- Landowners will visit nurseries and purchase plants.
- Landowners will assess current treatments of their lawn and create a different plan to care for it.

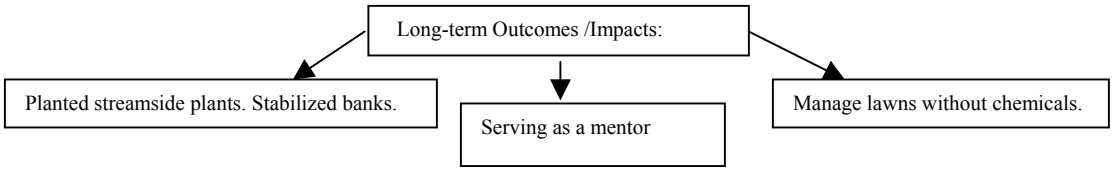
- Landowners will refer to best management practice (BMP) manual as they plan. Landowners will be working with a mentor.

Desired short-term outcomes:

- Landowners have increased knowledge about how their overall actions affect the creek.
- Landowners will understand that they have options in caring for their lawn that do not harm the creek.
- Landowners will have greater appreciation for the value of the creek.
- Landowners will learn from riparian landowners who have succeeded.

Let's break down each section and add evaluation questions - - What do we want to know? We also need to add indicators - - How will you know it?

Figure 2. Long-term Outcomes



Evaluation question: Is there an effective stream buffer that is stabilizing banks and catching runoff? Have chemical treatments been eliminated and replaced with safer, less polluting treatments? Has the trained landowner worked with a new landowner?
Indicators: Plants are in place; banks are no longer eroding; no lawn chemicals are being stored or used; landowner has a mentee; and landowner is using BMP manual.
Evaluation methods: Observation on-site, follow-up phone interview in six months to one year to see if landowner is participating as mentor.

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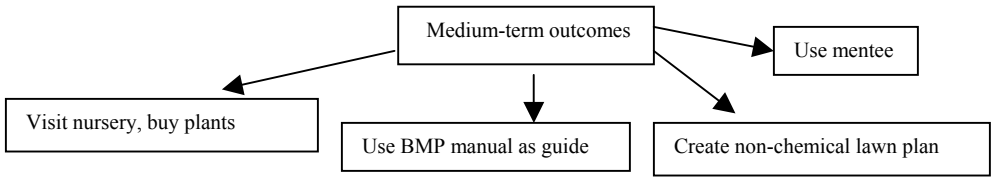
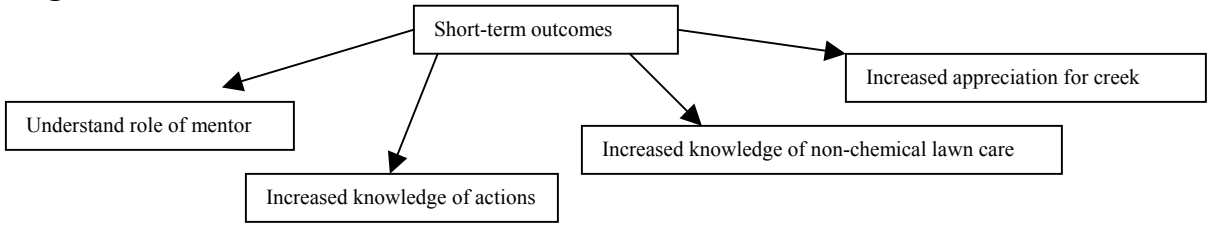
Figure 3. Medium-term Outcomes



Evaluation questions: Has the landowner taken steps to create a vegetative buffer? What steps have been taken to develop a plan for lawn care? Has the landowner actively used his mentor? Was the BMP manual used as a guide?
Indicators: Plants are on site; receipt is in hand for plant purchases; landowner has written outline of plan to change from lawn chemicals; landowner has articles/books on alternative lawn care; landowner has documentation of visit with mentor.
Evaluation methods: Observation via site visit; interview with mentor/mentee; written documentation of lawn plan.

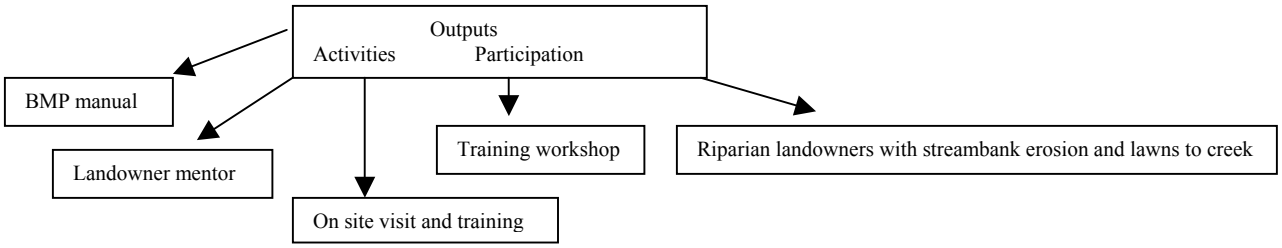
Figure 4. Short-term Outcomes



Evaluation questions: Did landowners show an increase in their knowledge about their impacts on the creek and what options exist regarding lawn care without chemicals? Can they relate how their appreciation of the creek has changed? Can they explain the role of a mentor?
Indicators: Asking appropriate questions, landowner can relate information regarding effects on creek; can name chemical alternatives; understands what a mentor's role is.
Evaluation methods: Pre-workshop/meeting questionnaire followed by same questions on post-questionnaire; on post-questionnaire, you might ask the landowners to complete the phrase "I never realized…" to get at increased awareness and appreciation.

Outputs

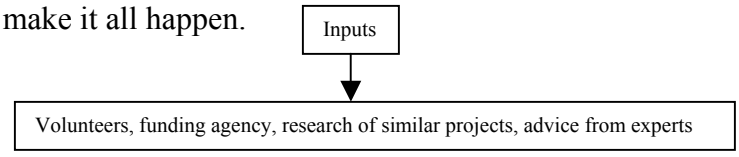
Once we were able to identify our outcomes and clearly understand what we wanted to achieve, the next step was to look at how we would get there. This meant deciding on what activities would be best suited for imparting information and affecting change. Workshops were one way to draw a large group of people and inform them at one time. We also knew that personal visits would show support and offer one-on-one guidance. We decided that a resource handbook that included BMPs and resources for funding would be a useful tool. Finally, we would include a role model, someone who had successfully taken steps to help the creek and could serve as a mentor/motivator.



Evaluation questions for the activities: Was the workshop outline followed and all parts used? Did landowner agree to site visit and actually meet and receive training on site? Did people understand the function of the BMP manual? Was the role of the mentor clear?
Evaluation questions for the participants: Did target riparian landowners attend? How did attendees respond? Who did not attend? Why didn't they attend?
Indicators: percent of people who attended (decide on a goal); positive/negative reactions; ability to explain what a BMP is; whether a site visit occurred; landowner agrees to work with mentor
Evaluation methods: post workshop evaluation; post workshop phone follow-up to non-attendees; observation.

Inputs

These are the resources we need to make it all happen.



Evaluation questions: Was the level of funding appropriate? Were there enough volunteers and was there enough time to accomplish the program? Were experts available?
Indicators: program was completed on time and within budget.

Putting it all together, you can see what the entire logic model looks like for our example, and how evaluation plays a role throughout the various stages. (See Attachment 1)

Types of Evaluation

There are many different ways to do evaluation. Most people immediately think of the methods for gathering information, such as surveys, interviews, observations, and focus groups. But, in the beginning, it is most important to focus the evaluation on a few key questions:

- What are you going to evaluate?
- What is the purpose of the evaluation?
- How will the evaluation results be used?

(A valuable reference tool, Focusing an Evaluation, can be found at: <http://uwex.edu/ces/pdande/evaluation/evaldocs.html>)

We will show you how we addressed those questions, using an example from Brookfield Zoo. At the zoo, we use evaluation extensively whenever we create a new exhibit. The same approach can be used when developing any product. The three main types of evaluation we use are front end, formative and summative. The purpose of the evaluation is slightly different for each type. **Front end evaluation** occurs during the planning stage and provides background information about potential audiences, such as their knowledge, interests, and attitudes towards the exhibit topic. The goal is to learn as much as we can about our target audience in an effort to predict how they will respond to our exhibit. This helps us adjust our messages to the needs and interests of our visitors.

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In the case of The Swamp exhibit at Brookfield Zoo, our over-arching theme, or "Big Idea," was: "Wetlands, such as swamps and riparian areas, provide many surprising benefits to humans, such as flood control, clean water, and recreation." For our front-end evaluation, we used a survey to assess the degree of visitor understanding about wetlands and swamps, and the benefits they provide.

Formative evaluation provides information on how to improve the components of your program as they are being designed. For example, we will often create prototypes of signs and get visitor reactions. By getting visitor feedback on their understanding of the content or their concerns about the way something is written, we can make changes before the final product is produced. I feel our interpretives are better because we go through this process, especially with challenging signs. Even talking to a few people can be helpful.

Summative evaluation tells you the impact of whatever you have produced. It is done once the program, project, or exhibit is completed. Summative can be simple or complex depending on what you want to know. If the only measure you care about is the total number participating, that is pretty easy. If you want to know if they learned the key messages or changed their behavior because they had exposure to your program, that is a lot more challenging.

For our Swamp exhibit, the exhibit team wanted to know: a) how visitors were using the exhibit, b) whether visitors were learning things related to the "Big Idea," c) whether they had a more positive attitude toward swamps, and d) whether the exhibit had increased their interest in doing wetland conserving behaviors. We observed visitors to document how they used the exhibit, and used pre- and post-exhibit interviews to measure changes in knowledge and attitudes.

To determine if the exhibit had any effect on visitor interest in doing conservation behaviors, we asked visitors to rate their interest in various behaviors using card sorts and scales. Some of the behaviors were featured in the exhibit and some were not. We were able to show that the exhibit significantly increased interest in talking to family and friends about wetlands and interest in visiting other wetland exhibits. When we conducted callback phone interviews after two months, we found a high degree of consistency in the responses.

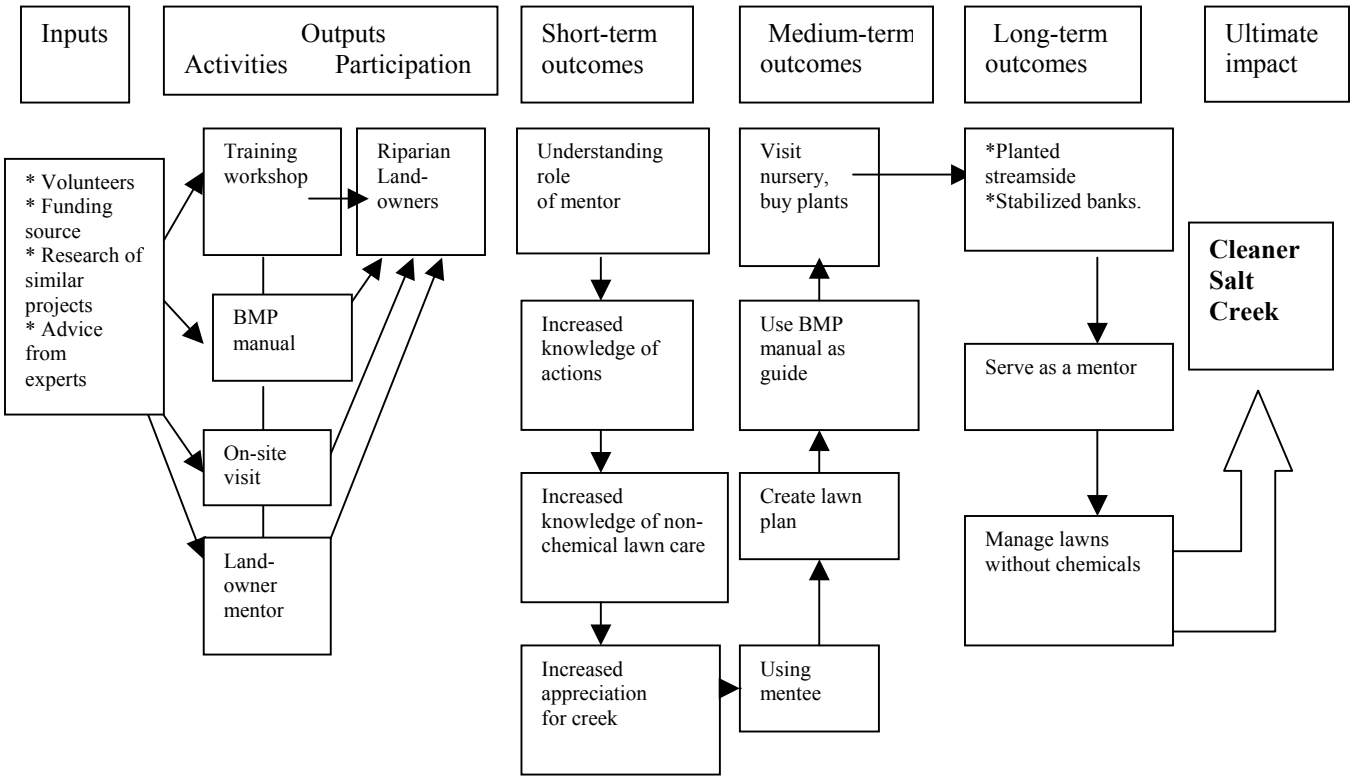
The exhibit team used the summative results to make a few changes to the exhibit. The behavior change results were used to inform the development of other exhibits.

Conclusion

I hope we have given you a better idea of what evaluation includes. The logic model example, with its inputs, outputs, and outcomes, provides a good framework for how to create an evaluation plan that you might include in a grant proposal. Starting with the outcomes and working backwards can help focus the key evaluation questions. For developing any new product, such as an exhibit, it is helpful to think of the three possible stages of evaluation: front-end, formative, and summative. In almost all cases, a little time spent in the beginning thinking about how you will document success will lead to a more effective program.

Attachments

Attachment 1: Putting it Together- The completed logic model



Resources

American Evaluation Association <http://www.eval.org> (Contact them for help finding a professional evaluator in your area.)

Coevolution Institute. April 2003. Executive Summary, Measuring Results

Diamond, Judy. 1999. Practical Evaluation Guide, Tools for Museum & Other Informal Educational Settings. AltaMira Press.

Innovation Network. Transforming Evaluation for Social Change. <http://www.innonet.org/index.cfm> (an excellent resource for links.)

National Science Foundation. January 2002. The 2002 User-Friendly Handbook for Project Evaluation.

University of Wisconsin Extension Service: Program Development and Evaluation <http://www.uwex.edu/ces/pdande/index.html>

W.K. Kellogg Foundation. October 2000. Logic Model Development Guide. <http://www.wkkf.org/>

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Hands-On NPS Pollution Education: Connecting with Teachers and Students through "Healthy Water, Healthy People"

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Abstract

Healthy Water, Healthy People, a new program of Project WET, uses innovative, interactive activities to demonstrate critical water quality concepts. The *Healthy Water, Healthy People* materials are designed to make the complex concepts of water quality understandable and relevant for everyone, and to demonstrate the connection between water quality and human and environmental health.

The activities in the *Healthy Water, Healthy People* Water Quality Educators Guide were developed by teachers working with water quality experts, and were field tested and reviewed nationally. They are correlated to science standards and packaged in an easy-to-use format that contains a 250-page activity guide that is cross-referenced with customized water quality testing kits, which are in turn supported by a reference manual covering 11 common water quality parameters. A comprehensive evaluation strategy has been implemented, and current data shows improvement trends in water quality behaviors and understanding based on pre- and post-workshop surveys.

The *Healthy Water, Healthy People* materials are ideally suited for educating youth and adults on nonpoint source pollution and water quality monitoring concepts. An educator may enhance the activities with field investigations to a local stream or lake to conduct water quality tests. Others may use the materials for classroom activities, group presentations, service learning projects, water festivals, or for integrating large concepts such as watersheds, stormwater regulations, or TMDLs with localized examples. Topics covered include nonpoint source pollution, cumulative impacts, accuracy vs. precision, data analysis, water study design, macroinvertebrates, best management practices, and water quality standards.

Helping youth and adults understand the relationship of healthy water to healthy people and environments is a critical link as they face future water quality challenges and opportunities. *Healthy Water, Healthy People* bridges the gap between water quality monitoring programs and education by providing a wellspring to water quality literacy.

Introduction

Healthy Water, Healthy People (HWHP), a new program of Project WET International based at Montana State University in Bozeman, Montana, has developed new water quality education

publications and program. The *Healthy Water, Healthy People Water Quality Educators Guide* forms the foundation of a comprehensive water quality education program that uses innovative, interactive activities and materials to demonstrate critical water quality concepts. The program was originated by Project WET International with the support of the Hach Scientific Foundation and in partnership with the Hach Company and Nestlé Waters North America. The HWHP materials are designed to make the complex concepts of water quality understandable and relevant for everyone, and to demonstrate the connection between water quality and human and environmental health.

The activities in the *Healthy Water, Healthy People Water Quality Educators Guide* were developed by teachers working with water quality experts, and were field tested and reviewed nationally and internationally. They are correlated to the National Science Education Content Standards and packaged in an easy-to-use format that contains a 250-page activity guide that is cross-referenced with customized water quality testing kits. The kits, in turn, are supported by the *Healthy Water, Healthy People Testing Kit Manual*, a 100-page reference text covering eleven common water quality parameters.

The HWHP materials are ideally suited for educating youth and adults on nonpoint source pollution, human and environmental health, the why of water monitoring, sanitation, beach pollution, the scientific method, and basic water quality concepts such as pH, alkalinity, water quality within the water cycle, and more. Educators may enhance these activities with field investigations at a local stream or lake to conduct water quality tests. Others may use the materials for classroom activities, group presentations, service learning projects, water festivals, or for integrating large concepts, such as watersheds, stormwater regulations, or Total Maximum Daily Loads (TMDLs) with localized examples. The activities and testing kits are currently being used by thousands of teachers and informal educators across the United States and internationally.

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A series of water quality testing kits have been developed in cooperation with the Hach Company. According to the teacher survey which guided their development, the primary features that educators were looking for in testing kits—cross-referenced with a curriculum and activity guide, ease of use, available at a fair price, and address the most important water quality parameters—are all incorporated in the HWHP package. The testing kits are packaged and cross-referenced with the *Healthy Water, Healthy People Water Quality Educators Guide* and the *Healthy Water, Healthy People Testing Kit Manual,* and cover a variety of grade levels and water quality testing situations.

Training Workshop Evaluation

Data from an ongoing program evaluation show improvement trends in water quality behaviors of participants and understanding of water quality concepts based on pre-/post-workshop surveys. The evaluation goals are as follows:

- To evaluate HWHP workshops in order to continually improve them, the program, and the materials,
- To collect workshop evaluation data from the outset of the program,
- To determine if HWHP workshops are effective, according to workshop participants, based on seven criteria,
- To determine if HWHP workshops increase participants' knowledge of general water quality topics, and
- To determine if behavior change data could be collected.

Healthy Water, Healthy People used the following methods to conduct this preliminary evaluation: Develop and implement pre- and post-workshop evaluations which contain general demographic information, ask the participant's primary goal for attendance at the workshop, ask four content questions that are duplicated in both pre and post evaluations, ask the participant to rate the workshop

instruction and materials, and ask qualitative post evaluation questions allowing for open comments. Confidential responses are guaranteed, and pre- and post-workshop evaluation connection is maintained by using participants' birthday (no year).

Preliminary Findings

- Participants do not resist these pre- and post-workshop evaluations.
- A very high percentage of participants plan to use HWHP in their teachings (96%).
- An amazing number of students are potentially reached by a small sample of participants (n=129; 176,012 students).
- Knowledge scores increase in post-test (6.14% increase).
- Some participants struggled with identifying pollution-sensitive macroinvertebrates from a list (62.7% answered correctly [stoneflies]).
- Generally, participants scored high on questions about nonpoint source pollutants and point sources.
- The participants rated the instructor effectiveness the highest of seven criteria, and grade level appropriateness the lowest.
- Average number of years of teaching experience of the educators in the sample is 12 years.
- A large percentage of participants (56%) said they expected their water quality protection behaviors to change (improve) as a result of HWHP workshops. The sample contained primarily educators already aware of the impacts of their actions on water quality.
- Participants shared important qualitative data that illuminated why they were participating, what they got out of the workshop, and the most valuable aspect of the workshop.

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For More Information

Training workshops are available for anyone interested in learning how to present water quality concepts using hands-on methods. Keep apprised of HWHP workshop opportunities by visiting the Web site, and look for the HWHP exhibit and presentations at upcoming conferences. For more information contact the director, John Etgen, toll free at 1-866-337-5486, Email healthywater@montana.edu, or visit the HWHP Web site at <http://www.healthywater.org/> and join the HWHP Newsgroup.

Helping students and adults understand the relationship of healthy water to healthy people and environments is imperative as they face future water quality challenges and opportunities. *Healthy Water, Healthy People* bridges the gap between water quality monitoring programs and education by providing a wellspring to water quality literacy.

Nonpoint Source Education for Municipal Officials (NEMO): Making it Work for Your State

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Abstract

Alabama Nonpoint Source Education for Municipal Officials (NEMO) is an education program to address water quality through land use and natural resource planning. Specifically, NEMO is focused on the explanation of nonpoint sources and their link to different land uses. Particular attention is paid to the role of impervious surfaces in the transport and concentration of pollutants. To guide towns, NEMO outlines a three-tiered strategy of natural resource-based planning, site design, and the use of stormwater best management practices that towns can use to address their land use and cope with nonpoint source pollution.

Alabama NEMO was adapted from the NEMO program that began in 1991 in Connecticut. The technical nature of the program was designed around the intended audience of engineers, planners, and commissioners—all decision-makers within the towns. Since then, NEMO has continued to give presentations by request across the state and is presently being implemented in 17 other states. Alabama NEMO also continues to work collaboratively with local groups on watershed projects, building on the original NEMO program with additional data layers, new audiences, and more partners. One of the unique characteristics of NEMO is that you can change the presentations to focus on various aspects in order to appeal to a variety of audiences ranging from city planners to master gardeners.

Alabama NEMO is a cooperative educational project led by the Greater Birmingham Regional Planning Commission along with the Alabama Department of Environmental Management, Alabama Association of Regional Councils of Government, CAWACO Resource Conservation & Development Council, Inc., Storm Water Management Authority, Inc., USDA-NRCS, and the Alabama Water Watch Association. There also is a dedicated advisory board of volunteers, agencies, representatives of the Water Works Association, businesses, and caring citizens.

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How the Program Developed

Alabama has a long agricultural tradition and its people identify readily with the land. Like many other parts of the country, as subdivisions are popping up in farm fields and woods, Alabamians are beginning to recognize the gradual degradation of their natural and cultural heritage.

In 1998, a consortium of Alabama agencies, led by the Alabama Department of Environmental Management (ADEM) and the Alabama Cooperative Extension System, contacted the NEMO Hub with interest in bringing the NEMO message to the state.

How/Where NEMO Works or Doesn't Work

Early in the planning process, the program's coordinators realized that in order to implement NEMO on a statewide basis, they would need dozens of people trained to present the program. Funding was not readily available, however, to support the number of professional outreach employees. So, with funding from the state's Section 319 Program, a coalition of state agencies led by ADEM designed a "train-the-trainers" workshop to prepare volunteers to give the program to municipalities and counties in their area. Alabama NEMO (AL NEMO) has developed a two-day curriculum designed to give participants the kind of "deep background" information they will need to be effective educators. Workshop participants

are armed with all the materials they will need to conduct the basic NEMO presentation, including a "NEMO Bible" and CDs with presentations and publications, such as fact sheets and promotional materials.

While some citizens recognize some growth issues, the majority of decision makers do not. This education and outreach approach was foundational to the Alabama program acceptance. Alabama has a diverse geography and an abundance of water (55 inches a year). Approaching elected officials was and still is a difficult task; they do not perceive a problem and are far more interested in local politics rather than a new quality of life program. The never-ending excuse about not having "home rule" or the funds to take these important steps in planning just does not get readily accepted. The team, therefore, has adopted the slogan: "Inch by inch everything is a cinch; by the yard everything is hard."

Another difficulty the team faced is the lack of good GIS information. Our state agency layers are old (or do not exist) and there is no central Alabama repository for this type of information. Land use maps are not available everywhere, so it is difficult to make accurate visuals for the decision makers. Because this technology is not in place, addressing impervious surfaces has been a challenge.

Accomplishments

AL NEMO has trained dozens of trainers across the state. These trainers have given over 300 presentations statewide to over 3,500 people—an impressive feat by a small army of volunteers. But, the AL NEMO coordinators have also worked to broaden the program's educational offerings to local officials, having developed programs on forestry, onsite wastewater, watershed restoration, and low impact site design. They have developed a program for businesses entitled "Business Partners for Clean Water" that will address the unique challenges local businesses face in being responsible stewards for clean water. As the message of NEMO has spread, there have been partnerships in the erosion and sediment control programs, in which "NEMO-bites" have been included. Partners here include the Soil and Water Conservation Society, Homebuilders Association, Alabama General Contractors Association, the Alabama Department of Transportation, Watershed Academy, and Land Trust Foundations.

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AL NEMO can also point to on-the-ground accomplishments of their program. In Baldwin County, a coastal area of rapid development, new subdivision rules have been adopted that provide for conservation subdivision design and other low impact development standards.

Spotlight on Fairhope

Fairhope is an innovative city adopting new development practices and initiating new plans to protect natural resources. The city is located in southwest Alabama on the eastern shore of Mobile Bay, in one of the fastest growing counties in the state. Working with members of the Alabama NEMO Task Force, Fairhope officials have begun to institute many innovative programs that will ensure their leadership in smart growth planning. Examples include:

Planning and "Smart Growth"

Fairhope has parks and green spaces interspersed throughout the community. Fairhope will continue its open space planning efforts in collaboration with AL NEMO as part of the EPA/NEMO Smart Growth Initiative, including emphases on:

- Shoreline protection and public access to local waters.
- Creating bicycle and pedestrian networks to and between residential and commercial areas to encourage neighborhood and community feeling.
- Planning for land use that centers on the "walk-able village" concept.

Stormwater Best Management Practices

The city partnered with Sherman International Corporation and the Coastal Alabama Clean Water Partnership to install permeable concrete at one of their new city facilities. An educational display on

stormwater and polluted runoff will promote water quality stewardship at this highly visible downtown facility. Future projects include:

- Perma-Turf (plastic grate topped with grass) at city lift stations, as an asphalt/concrete alternative, and
- Effective stormwater ordinances and educational brochures on sedimentation management, outlining penalties for violation.

In the municipality of Trussville, a bedroom community of Birmingham located in the head waters of the Cahaba River, new planning documents and ordinances have been recently developed that provide for greenway and open space planning, along with the designation of stream buffers to protect water quality. Other documents from some communities have been adopted by city councils only to be rescinded during a later session.

The Future

Although AL NEMO has been amazingly productive over the past several years, there is still much to be done. Many counties and municipalities are still in need of assistance, and even with the growing corps of AL NEMO volunteers, it will take years to reach them all. Coordinators of the program are finding a growing interest in NEMO, in part due to the initiation of the Clean Water Act Stormwater Phase II deadlines in early 2003. AL NEMO will continue to provide assistance and motivation to improve both planning and land use practices on the local level.

Recently, the Mississippi-Alabama Sea Grant Consortium, in collaboration with Dauphin Island Sea Lab-Coastal Policy Center and the Alabama Department of Conservation and Natural Resources Lands Division Coastal Section, hosted an Information Exchange Meeting for interested community planners and policy-makers in the coastal areas of Alabama and Mississippi. This information exchange meeting was on October 2, 2003. The purpose of the meeting was to discuss shared coastal community development issues and assist the Mississippi-Alabama Sea Grant in prioritizing funding efforts. Subjects included "Smart Growth" development strategies, such as watershed planning, small town development and re-development, and the like. Dr. Kimberly Brown, Director of the Small Town Center at Mississippi State University, was the special guest speaker at this meeting. So, the Alabama team continues to “inch” its way along the smart growth and natural resource planning trail. Your state has many peculiar issues, as does Alabama, and NEMO can and will fit in with your future growth. Take a look at the message and see how best you can adapt the program to the current method and pattern of growth in your communities.

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Tennessee Growth Readiness: Water Quality Matters

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Abstract

The Tennessee Growth Readiness program helps communities learn how land use decisions affect water quality, and then make informed choices about managing growth. The program helps them comply with new regulatory requirements.

Planners and public works officials are the program's target audience because they are intimately involved in the day-to-day, nuts-and-bolts of their community's land use and water quality decisions. Officials from four communities helped develop and pilot the program for their colleagues in other communities. They built the program from existing best practices that included the University of Connecticut's NEMO program, the state of Alabama's adaptation, and materials and ideas from the Center for Watershed Protection.

Program participants receive training, presentations, maps, and references. With these materials, they make presentations that explain simply and succinctly the complex issues and choices surrounding land use and water quality to elected officials, developers, builders, farmers, and homeowners. Each presentation describes why water quality is important from economic, quality-of-life, and legal perspectives. Audiences quickly learn about water pollution, watersheds, regulations, and land uses' contributions to water resource problems. Through simple community-specific maps, they see how current and future land uses might exacerbate existing water quality problems. Presentations conclude with action-oriented choices that allow for both growth and water quality.

The program team includes representatives from the Tennessee Department of Agriculture, University of Tennessee's Water Resources Research Center, Southeast Watershed Forum, and Tennessee Valley Authority. They led the program development, and now deliver training and provide support to Tennessee communities.

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The Tennessee Growth Readiness program helps communities learn how their land use decisions affect water quality. They learn how to comply with new regulatory requirements, and to make informed decisions about managing growth.

What worked well

"If you call this program Tennessee NEMO, people around here will think that you're part of the United Nations and are going to arrive in black helicopters to take away our land." This quote, from a pilot team member, illustrates how important it is to know your target audience, and how they view the world. The best way to do this is to involve them in the program from day one.

The audience for the Tennessee program is planners and public works officials. They are intimately involved in the day-to-day, nuts-and-bolts of their community's land use and water quality decisions. To ensure that we understood their perspective, we involved them in the program from its start. They were an integral part of our development team.

On our team was the planning director from Blount County, a rural gateway community to the Smokey Mountain National Park, whose population is growing at an annual rate of two percent. Also involved were the city engineers for Alcoa and Maryville—two growing towns in Blount County. Maryville has shown up on "Best Places to Live" lists in the past few years. From Knox County, we had the county's stormwater coordinator. Knox County is on the northwest border of Blount County and is

growing at an annual rate of one percent. Within its borders is Knoxville, the third most populous city in Tennessee. All four communities must meet the second phase of Clean Water Act requirements for stormwater, as must 81 other Tennessee communities.

Planners and public works officials participating in the Tennessee Growth Readiness program receive training, presentations, maps, and references. With these materials, they can explain succinctly the complex issues and choices surrounding land use and water quality to elected officials, developers, builders, farmers, and homeowners.

Each presentation describes why water quality is important from economic, quality of life, and legal perspectives. Audiences quickly learn about water pollution, watersheds, regulations, and land use contributions to water quality problems. Through simple, community-specific maps, they see how current and future land use could intensify existing water quality problems. Presentations conclude with actionable choices that allow communities to grow and preserve their water resources.

Participants can get help making these choices from the program's partners. One choice they have is to implement water quality friendly development rules. Program participants learn to lead a Site Planning Roundtable in their community. Through a roundtable, diverse community leaders select development rules from a pallet of 22 principles conceived by an equally diverse, national expert panel convened by the Center for Watershed Protection.

Keep your program simple and results oriented. USA Today was our inspiration. If you have the right development team and you listen to them, this will come easily. Well, maybe not easily. We used our pilot team and other trusted, knowledgeable partners to test our products. By piloting our training, we quickly learned how to simplify both the training experience and materials. We shortened the training from a whole day to a half-day. The presentation materials started as a complex toolkit of presentation segments. After the test, they morphed into nine presentations targeted at specific secondary audiences. Presentations could be delivered in 10 to 20 minutes each—about all the time our pilot community representatives assured us they would ever get on a county commission meeting or for a lunchtime speech. As a result of our efforts, our customers are now having great success reaching their elected officials and other influential community members for the first time, with a simple message about how land use affects water quality. Several participants credited our program with helping them finally get the authority and financial support that they needed to do their job—addressing stormwater issues in their community.

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Having pilot communities is a great way to create demand for the program. Do not underestimate the power of "me too." When other communities heard about our pilot communities at a statewide conference, they came to us requesting the program. Promoting the program has been crucial to its success. We take a two-pronged approach. We promote the program itself in addresses to statewide and regional gatherings of our target audience. The purpose of these addresses is to get planners and public works officials to sign up for program activities. Also, we promote the ideas embodied in the program to gatherings of elected officials—the secondary audience for this program. Through these presentations, we build awareness and understanding of the issues and choices surrounding land use and water quality with elected officials. The intent is that they will be more receptive to these ideas if they are hearing the same message from several sources—speakers at conferences and then their own staff.

Lessons learned

For financial reasons, we delayed the program rollout for a year. Through frugal project management and partners' support, we provided limited training and materials to "early adopter" communities in advance of the rollout. An earlier rollout date could have benefited more communities sooner. However, the delay did give us time to refine our product. The "early adopters" helped build awareness for the program.

When we started the program, we had a vision of the products that we would offer to our target audiences. We envisioned three training classes: one on how to build awareness of issues and support for tackling them, another on tackling issues by changing development rules, and finally one about integrating water resource issues into comprehensive plans. We also envisioned regional organizations like the Tennessee Valley Authority (TVA) and our other partners providing "light touch" support to communities implementing these choices. However, we began the program rollout without working out all of these details. In part, we did this to learn from our pilot communities, who were testing out the Center for Watershed Protection's Site Planning Roundtable and Watershed Planning approaches. Using what we have learned from the pilot communities, we have tested a site planning roundtable training class and are beginning to scope a comprehensive planning for water resources class. We are beginning to work with our partners to provide support to communities. It would have been great to have it all worked out when we first started. However, waiting and learning from our pilots has allowed us to develop products that are much more relevant to Tennessee communities.

What we would change

The idea that you need a diverse mix of partners involved from day one came more into focus over the course of the project. We had a good mix of partners involved in developing the program. Looking back, we should have involved some others at the beginning, notably our state's planning assistance organization and our development districts. We should have formed an advisory panel made up of representatives from progressive communities and organizations across the state to review work in progress. While we did some of that, we could have been more deliberate about it. These partners and supporters are on board now. Earlier engagement could have made the program even better.

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Our advice

If you want to start a NEMO program, do so in partnership with a statewide organization that will be around for a while. Align your program with a non-regulatory part of government. The university system, state economic development, and agriculture departments are all good candidate homes for the program. In Tennessee, the program is sponsored and funded in part by the Tennessee Department of Agriculture. Other partners include UT's Water Resources Research Center and Southeast Watershed Forum.

Have a clear "picture" of what success looks like. Work with your development team to formulate this vision and a clear plan for achieving it. As you move through your plan, be open to serendipity. As you begin to pilot your program and talk about it at conferences, new opportunities will present themselves that will further your objectives. When we started in Tennessee, we realized that what we were developing might be useful to Stormwater Phase II communities. We could not have anticipated how the Department of Environment and Conservation would help promote our program through their regional workshops for Phase II communities, and how an informal statewide working group would form and become actively interested in our program.

Borrow liberally from others. In Tennessee, we built our program from existing best practices by the University of Connecticut, State of Alabama, and Center for Watershed Protection. There is no need to reinvent the wheel. Instead, focus resources on packaging existing materials so that they are instantly relevant to your audience. Your state partners will like this because they spend less on new program development and more on implementation. When you borrow liberally, give credit liberally even if materials are not copyrighted. The organizations and individuals that developed content for your program are your partners too!

Finally, become part of the National NEMO Network. As part of the network, we benefited immensely from this national treasure at the University of Connecticut. Additionally, we met others like ourselves forming and running statewide NEMO programs. Our investment of time and money in the activities of the network has paid off handsomely.

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Innovative Partnerships for Public Outreach on Private Well and Septic System Management

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Abstract

Many homeowners lack education on their role in water quality degradation and how normal daily activities within homes and yards can contribute to water quality problems. Homeowners need to understand how water moves through the earth and how a failing or neglected septic system or well could contaminate their drinking water and directly affect environmental and personal health.

Private septic systems are known polluters of the environment. Most homes with septic systems also have wells for drinking water. It is imperative that both systems are maintained since they are in close proximity. More than 30,000 of the existing 427,000+ septic systems in Maryland are known to be failing, with estimates of 60% suspected to be failing. Thousands more are being installed each year. Most of these failures are due to mismanagement and improper installation. Urban dwellers are moving to rural areas and are not familiar with these systems. Realtors and builders selling the homes do not provide information on these systems. Worse, the word-of-mouth information people pass along is usually incorrect and harmful.

Workshops are presented to more than 1,500 homeowners each year throughout the state of Maryland. Participants are taught ground water and surface water hydrology (using a visual ground water model), how they affect water quality, and well and septic system management. Information is also provided on handy file-folder format fact sheets.

The Maryland State Realtors Commission has approved and recommended the program for continued education certification credits for realtors. Reaching realtors throughout the state will allow a more efficient transfer of this knowledge to the hundreds of thousands of homeowners with these systems. Over 1,200 realtors have attended this three-credit hour course.

In addition to educating homeowners and realtors, volunteer Master Gardeners are being trained to take this information to homeowners. Through the Bay-Wise Master Gardener Program, Master Gardeners are offered the opportunity to continue their education. They are taught the connection between gardening and water quality. Topics such as proper fertilizer practices, water conservation, landscaping with water quality in mind, using indigenous, native and resistant plants, managing household hazardous waste, and the do's and don'ts if you have a private well or septic system are covered in their course work. They then take this information to their clients. Over 400 Master Gardeners have been trained.

Evaluations are collected on change of behavior results, and money-saved as a result of the education. In addition, this educational material has been posted on the Internet and receives over 2,000 visits each month.

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Introduction

The goal of this program is to educate homeowners on the importance of the maintenance of their private drinking water and onsite sewage systems. It is important for homeowners to understand how water moves through the earth, and how a failing or neglected septic system or well could contaminate their drinking water and directly affect environmental and personal health.

Many Maryland residents lack education on their role in water quality degradation. Daily normal activities within homes and yards can contribute to water quality problems. This program has been designed to educate homeowners on how they directly affect water quality. Private septic systems are known polluters of the environment. Most homes with onsite wastewater treatment systems also have private wells for drinking water. It is imperative that both systems are maintained, since they are in close

proximity. According to the Maryland Department of Environment, more than 30,000 of the existing 427,000+ septic systems in the state are known to be failing, with estimates of 60% suspected to be failing! Yet, thousands more are being installed each year. Most of these failures are due to mismanagement and improper installation. In addition, urban residents are moving to more rural areas and are not familiar with the maintenance requirements of a septic system or well. (Of course, this also goes for many lifelong rural residents!) Realtors and builders selling the homes do not provide information on these systems. Worse, the word-of-mouth information people pass along is usually incorrect.

Thousands of homes with onsite wells and septic systems are bought and sold each year with the homeowners and realtors involved being clueless about these systems. The homebuyer assumes the realtor knows about the systems, and is giving them the proper information. The realtor assumes the inspectors know about the systems, and go by their word. In the end, no one knows about the systems!

In Maryland, there is no uniform tracking system or database that allows any governing agency to administer information or regulation of these systems. The local county health departments do not even know how many systems they have in their counties, much less where specifically they are located. This also translates to the fact that there is no mechanism in place to assure the systems are maintained. Even if a homeowner is made aware of the fact that a septic system has to be pumped out, they usually have no idea where their system is in the yard, because the county health departments do not require the systems to be marked to the surface. The only time an inspection might be required is during a real estate transaction. This inspection is requested by the lending institution (mortgage company), not the health department. To make matters worse, the inspectors are not certified, so anyone can call himself or herself an inspector—whether or not they even know what a septic system looks like! Most inspectors do not even locate the septic tank, let alone uncover it, examine the baffles, the distribution box, and the drainfield. The homebuyer is not given any information as to the care and maintenance of the system. To make matters worse, there are numerous businesses that take advantage of this lack of knowledge and sell homeowners gimmick products with false claims. Other contractors perform shoddy work for the homeowner.

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Even more serious of a health threat is the fact that people on private drinking wells are not even aware that they are solely responsible for ensuring the water is safe to drink. The health department does not require water testing of private wells. As with the businesses that prey on people concerning septic systems, there are also water testing and treatment companies that prey on the uninformed and sell people unnecessary and expensive treatment devices.

Usually the only time homeowners are made aware of their systems is during the buying and selling of their homes. Since realtors lead this process, it is imperative that they have a good knowledge of these private systems. Unfortunately, most do not. Advice is given out that is incorrect, like adding too much chlorine to a well if chlorination is necessary, or only having a dye test performed on the septic system. Worse, more than simply temporarily killing bacteria in a well through chlorination, the prospective buyer should be made aware that there could possibly be a long-term problem with the well, and hence the bacterial presence. Some realtors are trying to make sure the transaction is not derailed, and downplay any exposed problems. But, most simply do not understand the importance of a proper inspection and the consequences of some of the findings. Besides the importance of these matters to the homeowners, there is also the significant threat malfunctioning systems can have on the environment, specifically, water resources.

Workshops for Realtors

Since realtors are typically the “Front Line” for homeowners, and deal with the buying and selling of homes on private systems, it is only natural that educating them on these issues would be an effective

way to reach homeowners. Holding workshops for realtors allows for a wider dissemination of the information.

Partnering with Realtor Associations is a natural fit since realtors need to obtain continuing education credits in order to keep their licenses. Also, now that realtors are held more liable in transactions (full disclosure laws, etc.), they are anxious to be more enlightened on wells and septics, since these systems can present a constant headache during real estate transactions.

Besides realtors, partnering has been quite successful with Master Gardener Associations, Homeowner Associations, the League of Women Voters, Service Organizations, County Health Departments, the Public Library System, the Chesapeake Bay Tributary Strategies Teams, and various environmental organizations, to name a few. All these organizations have good networks in place and can help facilitate workshops easily, thus reaching large numbers of people. The typical program agenda includes:

Introduction to Ground and Surface Water Hydrology –
A Demonstration With a Model to Illustrate:

- The Water Cycle
- How Surface and Ground Water Interact
- How Water Moves Through the Earth
- How Wells Work
- How We Can Affect Ground Water
- How Springs occur
- How Contaminants Move Into Our Drinking Wells
- Factors Contributing to Water Quality
- How What You Do In Your Yard Affects Water Quality
- How What You Do In Your Home Affects Water Quality

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Your Private Well

- Well Construction and Components
- How to Get Information On Your Well
- Well Maintenance
- Water Quality Protection
- Water Quality: Testing and Interpretation
- Treatment Devices
- Proper Chlorination Procedure

Septic Systems

- Designs and Construction
- Components
- Function
- Maintenance
- Problems and Solutions
- Do’s and Don’ts

The best teaching tool for demonstrating to workshop participants the importance of the topic is the ground water model designed and manufactured by the University of Wisconsin. This visual model clearly demonstrates how ground and surface water interact, and how we as individuals can affect water quality. This model is available at:

AWRA Groundwater Model Project
College of Natural Resources, Room 252A
University of Wisconsin - Stevens Point
Stevens Point, WI 54481
Or for more information:
•Call us at (715) 346-4613
•Fax us at (715) 346-3624 or
•Email us at gwmproj@uwsp.edu

Since the components of a well or septic system are buried underground, most people have never seen them, let alone understand how they function. Therefore, also included in the seminars is a PowerPoint presentation, complete with slides of all the components of these systems. This enables workshop participants to more clearly understand the function and management issues of these systems.

A successful handout component of the program is two individual file-folder type publications. These four-sided printed folders give vital information about wells and septic systems, and provide a convenient place for homeowners to keep their records associated with these systems. The folders are distributed to class participants, but also distributed by county health departments, septic haulers, and several water testing laboratories. They are also available on-line. To date, over 50,000 folders have been requested.

Utilizing the Internet has enabled widespread, inexpensive dispersal of this important information. Web pages specific to septic system care and maintenance, and private well management, are receiving over 30,000 visits per year, and increasing. The Web pages offer the opportunity of asking questions via Email, and thousands of system owners request information yearly.

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The Internet also offers a convenient and inexpensive way to obtain evaluation results. An automatic program evaluation survey is posted on the Internet, allowing clients to quickly answer a few program evaluation questions without the cost and hassle of mass mailings. Also, using Email to send out evaluation surveys affords an inexpensive way to obtain program evaluations.

One of the problems encountered with the program was convincing the Maryland Real Estate Commission of the importance of realtors obtaining training on wells and septic systems. The commission's original stance was that of not wanting realtors to be made aware of these systems, because it would simply create another avenue on which they could be held liable! If any realtor who sells a home with private well or septic system advises their clients on procedures for these systems, they are already liable for their advice. A Realtors Association decided to take on this battle. They felt vulnerable in this subject area to begin with. They found this information was important to them in order to be able to do a good job for their clients, and that their lack of knowledge made them all the more vulnerable to litigation. Therefore, they hired an attorney to fight for continuing education credits for this course. The commission reversed their decision, and now the course is accredited.

Another problem that developed was each group wanting their own individual seminar. This became expensive in time and travel, and inefficient, considering larger groups could be gathered if the program was listed in the local paper or advertised to the public. Also, without a pre-registration, there was no way of knowing ahead of time whether the group would be large enough to be worthwhile. Now, required pre-registration allows for the efficient use of resources, as poorly attended programs can be rescheduled. With pre-registration, the few people listed can be notified of the postponement.

With growing budget shortfalls and cuts, it has become necessary to begin charging for expensive publications. If the publications are made available for purchase during a program, attendees tend not to bother obtaining them. However, if the cost of the publication is built in to the program fee, participants appear to be pleased with the handouts they receive for their nominal class fee! In addition to

publication/class fees, professional organizations, such as the realty groups, are now billed for mileage expenses.

In utilizing partnering, logistics such as advertising, room reservation, pre-registration, refreshments, etc. can be required of the partnering group, therefore freeing up extension personnel with these expenses and hassles.

Typically 20 workshops for homeowner groups are held annually, with more than 1,500 homeowners in attendance. Six to ten realtor workshops are held each year, with and average class size of 60 or larger. More than 200 Master Gardeners have been trained to date, and continue to disseminate the information daily in their teachings.

Conclusion

As a result of this program, more people and groups are aware of the nitrogen problem associated with onsite disposal systems, and are more accepting of the proposed regulatory changes for requiring nitrogen reduction in septic systems.

Evaluations show that many homeowners have saved hundreds to thousands of dollars as a direct result of their acquired knowledge from this program. They no longer are purchasing gimmick products, ignoring the care of their systems (leading to premature failure), or purchasing unnecessary treatment devices. But more importantly, those that do need treatment devices or repairs learn of this necessity, and have taken the action of correcting their potential health and environmental problems.

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Kentucky Nonpoint Source Partnerships for Excellence in Water Quality Education

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Abstract

Kentucky is rich in water resources, as well as cooperative programs to improve its citizens' understanding and appreciation for them. Based on a 1999 survey by the Kentucky Environmental Education Council, water pollution is listed as the number one environmental concern for over 40% of the respondents. While much effort has been devoted to water education for school-age students, our adult population is not as well informed. A collaborative effort by over 20 partners will seek to remedy this situation.

This paper will discuss the formation of the Comprehensive Commonwealth Water Education Project (CCWEP), its goals, products, and the tools that will be used to evaluate the results.

Introduction

Kentucky is a geographically and culturally diverse state. With over 89,400 miles of surface water starting in the mountains of eastern Kentucky and extending to the wetlands of western Kentucky, the state exhibits a rich variety of aquatic ecosystems. In addition to our surface waters, Kentucky is home to miles of underground rivers and streams that are part of our cave ecosystems. Mammoth Cave, the world's longest explored cave, houses many rare and endangered species. The Green River is home to the world's most diverse population of fresh water mussels. Our population interacts with water in many ways across the Commonwealth. Because there has been no education program offered exclusively to adults, the CCWEP partnership was formed and applied for a 319(h) grant to provide an extensive array of educational opportunities for our adult population.

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The Partners

The Kentucky Environmental Education Council, a state agency, conceived the idea of bringing together multiple organizations to develop a comprehensive water education program that could reach every citizen of the Commonwealth. These organizations included:

- State University Centers for Environmental Education,
- The Kentucky Educational Television Network,
- Department for Fish & Wildlife Resources,
- The School of Journalism at Western Kentucky State University,
- The Kentucky League of Cities,
- Kentucky Transportation Center,
- University of Kentucky Cooperative Extension Service,
- Kentucky Association of Counties,
- The Kentucky Association for Environmental Education,
- East Kentucky Science Center, and several other organizations.

The main premise of the idea was to be collaborative in developing the project.

Goals of the Project

The goal of the project is to combine the talents, resources, and experience of numerous state partners in a project designed to improve not only the nonpoint source knowledge base of all the citizens of Kentucky, but also their ability and willingness to take personal and collective action to improve the quality of Kentucky's streams and rivers. There are several objectives in this project:

1) To raise awareness about nonpoint source water pollution and through the development of a unified, multimedia message to create a "demand" for more information. This will be accomplished through radio and TV spots, a Web site, press releases, and "branding" of a newly developed logo to represent specific impacts to water quality prevalent in certain areas of the Commonwealth.
2) To create a set of professional development tools to be used to improve the ability of teachers to teach about issues related to nonpoint source pollution. These tools will include the development of a documentary on rivers, a virtual watershed and in-classroom broadcast of these programs, a unit of study to accompany a "Living Stream" exhibit, as well as three professional development workshops for teachers.
3) To help the general public and locally elected officials understand nonpoint source pollution and to train people across the Commonwealth to present these workshops. Kentucky will adapt the Growth Readiness program used by the Tennessee Valley Authority to help train the officials and the public who will give 362 workshops over the course of five years.

While each aspect of this project is important both in and of itself and to the whole, this paper will concentrate on the model we will use to deliver the teacher professional development workshops.

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Reading the River

In 2001 Northern Kentucky University and Morehead State University, in cooperation with the Boone-Kenton County Extension Service, the Daniel Boone National Forest, the Kentucky Division of Water, and other cooperators, launched the first teacher professional development workshop called Reading the River. From the outset, the program has concentrated on providing teachers with improved instructional models for combining teaching science with language arts, social science, art, and music. Participants spend one entire week either on the Licking River or near to it. The program begins at the source water in Magoffin County and proceeds to the Ohio River at Cincinnati. Teachers are introduced to new teaching technologies, various instructional strategies, utilizing expanded community resources, using field based investigations, and using interdisciplinary subjects. Participants are expected to develop a plan to apply their learning to their classroom teaching during the following school year. The product will align the content being taught with the Kentucky Core Content for Assessment or the parochial district curriculum guidelines. It can involve such applications as a series of lessons, the development of learning centers, the development of course materials to supplement their teaching, or it can involve students in citizen volunteer groups that conduct water quality testing and monitoring.

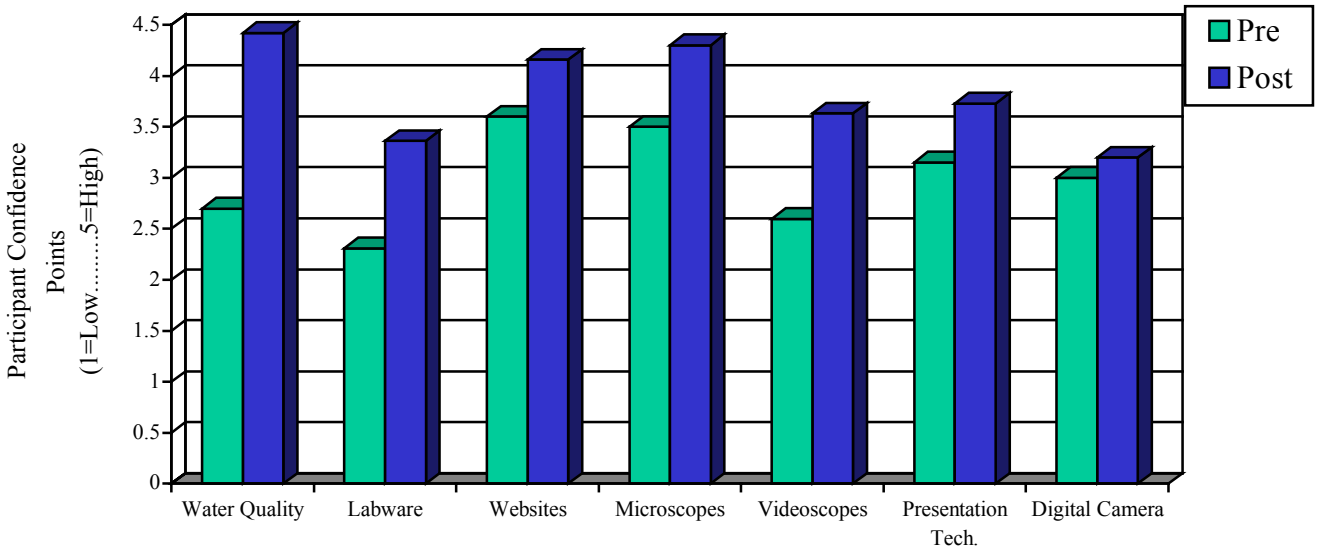
An important goal of the project is to develop curricula specific to the Licking River that can be used by other teachers in the watershed and that can be adapted for use in other watersheds throughout the Commonwealth. These materials can be found on the Reading the River Web site.

Evaluation

Evaluation of the 2003 program was done by pre-test, post-test, and long-term post-testing comparisons using a simple T-test. Workshop participants consisted of 10 men and 10 women, 15 of whom were science teachers. Participants were tested on their levels of confidence in the following categories: use of

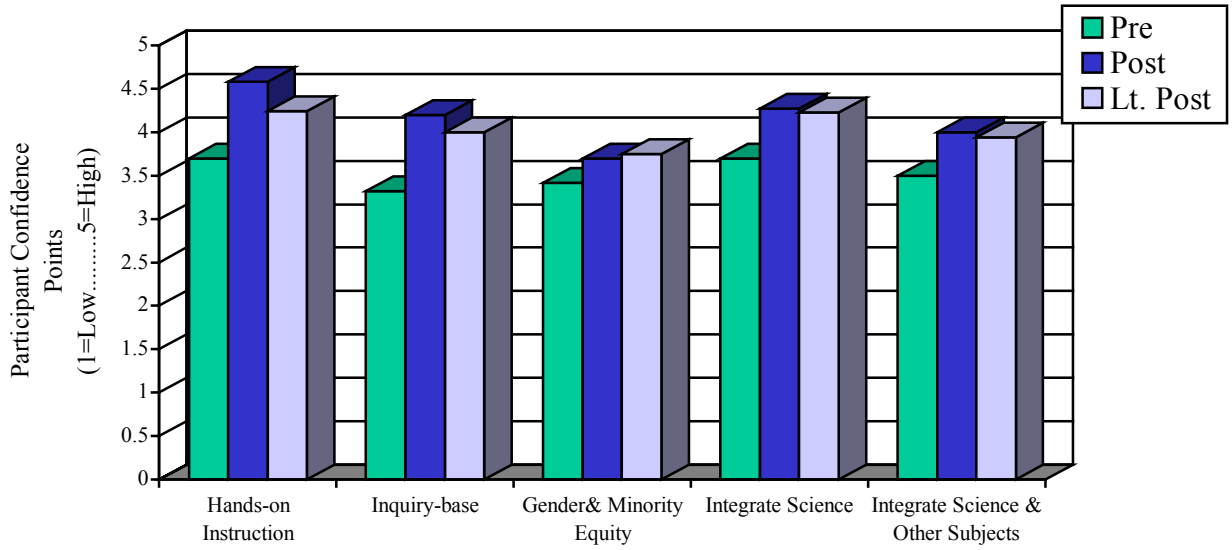
technology, use of instructional strategies, use of community resources, use of field-based investigations, and teaching program topics. Figure 1 shows that the greatest increase in confidence levels in use of technology was realized in the area of water quality, specifically testing techniques and equipment.

Figure 1. Average Pre and Post Confidence Rating in the Use of Program Technology



Figures 2 and 3 show high increases of confidence in the use of new instructional strategies in hands-on instruction and inquiry based learning, as well as significantly increased levels of confidence in field-based studies in water chemistry and macroinvertebrates.

Figure 2. Average Pre, Post, and Long-term Post Confidence Rating in the Use of Instructional Strategies



Fish studies and geology also realized increased levels of confidence. Although the majority of the participants were science teachers, they were not overly confident in their ability to use technology and field-based studies (see Figure 4). The testing also revealed an increased knowledge of watersheds.

Figure 3. Average Pre and Post Confidence Ratings for the Use of Field Based Investigations

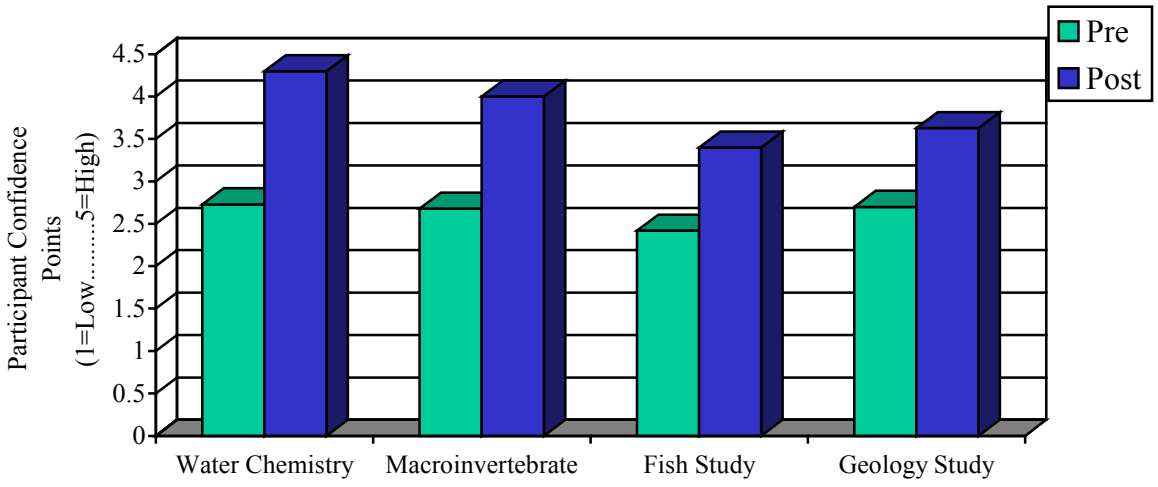
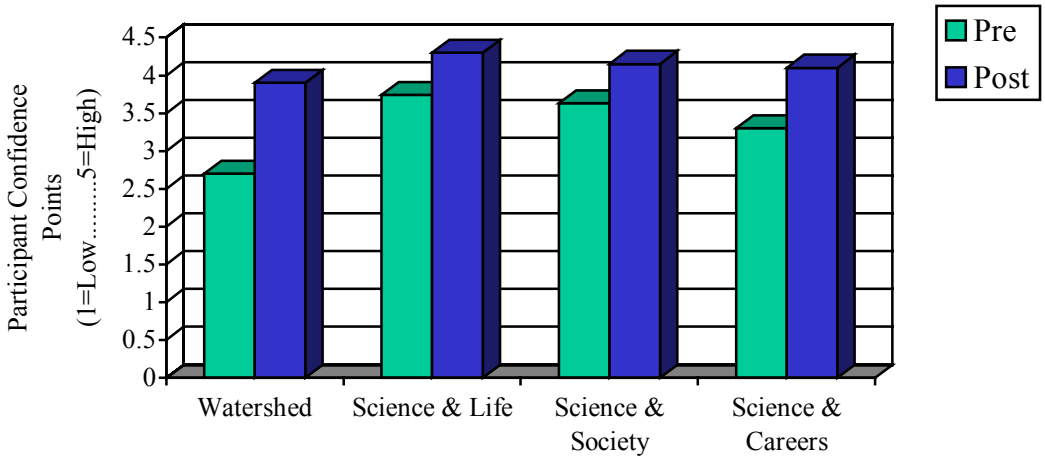
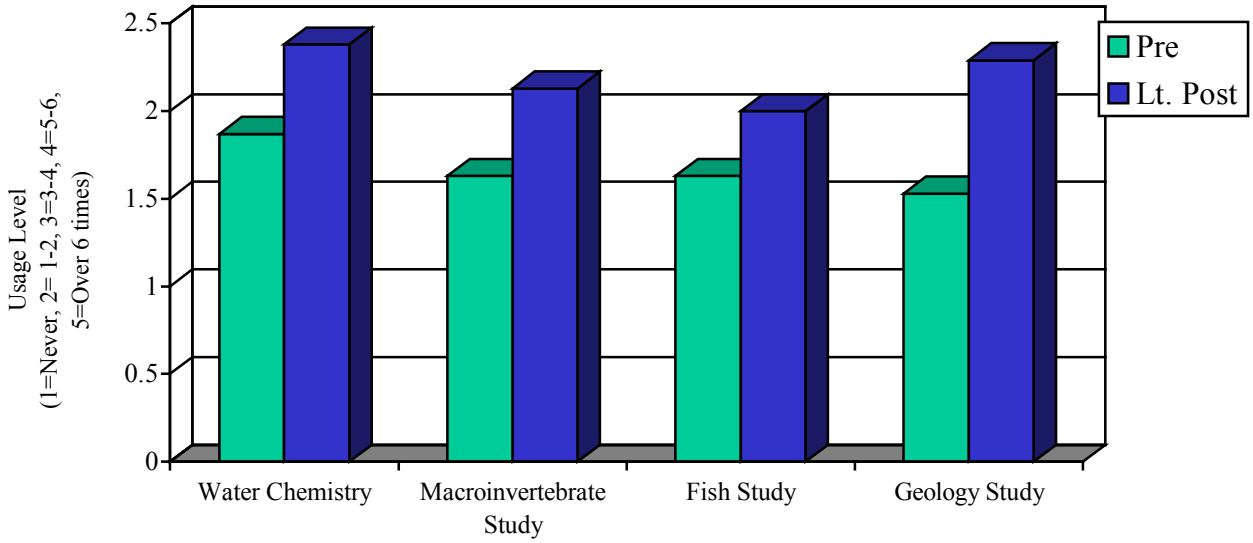


Figure 4. Average Pre and Post Confidence Ratings in the Ability to Teach Program Topics



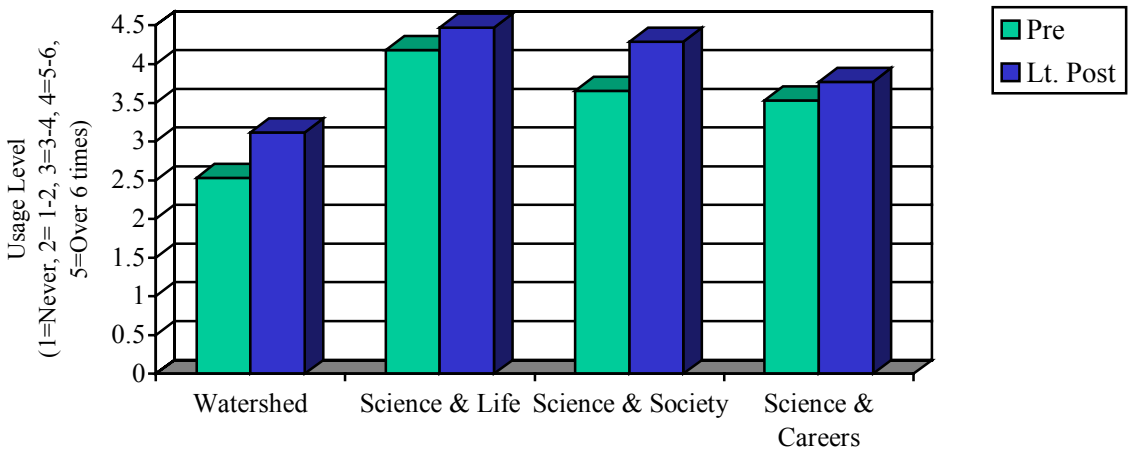
The long-term post-test on use of technologies showed that teachers who had participated in the workshop continued to use newly introduced technologies at high rates. Figure 5 shows that in field-based investigations, water chemistry and geology continued to top the list while macroinvertebrate and fish studies maintained high levels of interest.

Figure 5. Average Pre and Long-term Post Use of Field Based Investigations



Long-term post-testing revealed continued teaching about watersheds and science and society was greater than science and life or science and careers (see Figure 6).

Figure 6. Average Pre and Long-term Post Reported Teaching of Program Topics



Most importantly, for all states that are looking to increase scores on assessment tests, most teachers reported that their students were more attentive and involved in classroom activities, exhibited an increased quality of work, and have improved their state assessment test scores (See Figure 7). The program has also resulted in the development of pro-environmental attitudes.

Figure 7. Long-term Follow-up: Impact of the Program on Students
(1 Strongly agree ----5 Strongly disagree)

- My students are more attentive and involved in classroom activities. M=2.32
- The quality of student work is noticeably improved. M=2.42
- Student scores of statewide student assessments have improved M=2.8

Conclusion

Programs such as Reading the River can be utilized by nonpoint source programs, in conjunction with university partners, to aid the university in delivering quality teacher education. Universities provide a wide array of disciplines that can be integrated into an interdisciplinary study utilizing the sciences, arts, music, language arts, and social sciences. These can be used to create an engaging and unbiased program of study for teachers, helping them understand and teach about our natural resources.

The CCWEP Partners are combining the best of their summer institutes and workshops to reflect the highest quality of environmental education on nonpoint source pollution. The model of Reading The River will be used as a prototype for the quality, content, and results that our statewide professional teacher development component will exhibit. The role of the nonpoint source program can be one of empowerment through funding and technical assistance, moral support, and involvement in developing these programs. Nonpoint source programs benefit from increased knowledge, resulting in a better understanding of how human actions impact water quality and what can be done to improve it.

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Environmental Education Materials: Guidelines for Excellence

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Abstract

This manuscript will provide an introduction to the *Environmental Education Materials: Guidelines for Excellence*. It will focus on how to use the guide as a tool to develop and evaluate quality environmental education materials. The guidelines offer a way to judge the relative merit of different materials, a standard aim for developing new materials, and a set of ideas about what a well-rounded environmental education curriculum might look like. The materials and guidelines have been endorsed by more than 3,000 state, local, and national organizations including the National Science Teachers Association, the Association for Supervision and Curriculum Development, and others. The guidelines allow organizations, as well as individual school districts, schools, and teachers to qualitatively measure the content, materials, information, and presentation of their environmental education programs. In addition, the guidelines provide teachers with the professional parameters for high quality environmental instruction. They establish criteria based upon fairness, accuracy, depth, skill-building, instructional soundness, and usability.

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The *Environmental Education Materials: Guidelines for Excellence* is geared toward helping the educator, administrator, curriculum designer, or material developer evaluate the quality of environmental education materials. The guidelines point out six key characteristics of quality environmental education materials.

1) Fairness and Accuracy: Environmental education materials should be fair and accurate in describing environmental problems, issues, and conditions, and in reflecting the diversity of perspectives on them.
2) Depth: Environmental education materials should foster awareness of the natural and built environment, an understanding of environmental concepts, conditions, and issues, and an awareness of the feelings, values, attitudes, and perceptions at the heart of environmental issues, as appropriate for different developmental levels.
3) Emphasis on Skills Building: Environmental education materials should build on lifelong skills that enable learners to prevent and address environmental issues.
4) Action Orientation: Environmental education materials should promote civic responsibility, encouraging learners to use their knowledge, personal skills, and assessments of environmental issues as a basis for environmental problem solving and action.
5) Instructional Soundness: Environmental education materials should rely on instructional techniques that create an effective learning environment.
6) Usability: Environmental education materials should be well designed and easy to use.

Each characteristic contains guidelines and indicators for materials to follow. Indicators suggest ways of measuring whether the materials evaluated or developed, follow the guidelines. They are groups of attributes that you might look for to help determine whether the characteristic is included in the materials you are reviewing or developing.

The guidelines were developed through the National Project for Excellence in Environmental Education. The North American Association for Environmental Education has taken the lead in

establishing guidelines for developing coherent, cogent, and comprehensive environmental education programs. The guidelines will also point the way toward using environmental education as a means for meeting standards set by traditional disciplines, and providing students with opportunities for synthesizing knowledge across disciplines. Quality environmental education facilitates the teaching of all subject disciplines and will help educators develop meaningful environmental education programs that integrate across, and build up, each of the disciplines.

The Environmental Education Collection: A Review of Resources for Educators Volumes 1, 2, and 3 curriculum materials were evaluated using the *Environmental Education Materials: Guidelines for Excellence*. The write-ups included were designed to point out a variety of factors an educator might wish to consider when deciding which materials are the most appropriate for a group of students, and how those materials might be used most effectively. All reviewers made an effort to evaluate materials using their best judgment and their best understanding of the *Environmental Education Materials: Guidelines for Excellence*. The reviewers noted both strengths and weaknesses for each of the resources. Approximately 150 different environmental education materials are included in the three compendiums.

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A Watershed Approach to Increasing Teacher Confidence and Competency

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Abstract

Some environmental experts have predicted that our society has between 20 and 40 years to learn how to live sustainably on Earth, while meeting the needs of our growing population. At this time, our country faces the simultaneous challenges of dealing with the degradation of our environment, and of providing quality learning experiences in an overburdened public education system. Achieving this societal shift will require that we nurture a generation of citizens with a sense of stewardship toward the natural environment.

Teachers need a comprehensive set of skills and the support of local resources to succeed in the classroom and adequately meet the needs of their students. *Adopt-A-Watershed* empowers communities to care for their watersheds and enhance student learning by providing local leadership development, educational tools, and access to a national network of resources. Through an intensive Place-Based Leadership Development program for educators, we build a foundation of knowledge and community support for environment-based education using the local watershed as the context for learning.

To generate a legacy of stewardship and understanding requires leadership and work that is coordinated among schools, resource agencies, private business, and the community at large. This session will provide examples of successful professional development programs across the country and concrete steps for building one of your own.

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Introduction

I want you to close your eyes and picture the community you live in, your watershed. Picture a sparklingly healthy environment, free of litter, pollutants, and toxics. Picture people—business leaders, educators, environmentalists, and government agencies—sitting down together to plan for the future. Picture students achieving at an all time high and participating in civic life. And imagine more money pouring in to support your work than you know what to do with. Does this sound like your community? Would you like it to?

During the course of the conference, we have been introduced to numerous outreach and educational programs—wonderful, rich, inspirational programs designed to implement in our home communities. But, none of them will succeed unless you build community leadership to make it happen. That is where Adopt-A-Watershed (AAW) comes into the picture.

At Adopt-A-Watershed, our **mission** is to empower communities to care for their watersheds and improve student learning by providing leadership development, educational tools, and a national network of resources.

Our **vision** is for education to serve as the cornerstone of a sustainable community, in which people consciously act to ensure a healthy quality of life for current and future generations. Our environment-based education programs promote this vision by engaging students in real-world activities that lead to an understanding of sustainability and how their choices impact their community and the overall environment.

Our **goals** are to enhance K-12 education, encourage watershed stewardship, and inspire hope—and through those means, build community vitality. We work on a grass-roots level to build successful leaders in education and the community at large, by using watersheds as the defining context.

What does success look like in building programs like this? AAW has studied the path that leads to success for 15 years, and we have found consistent patterns. Success looks like:

- An involved community,
- Enhanced student learning,
- Active watershed stewards,
- Engaged learners, and
- Critical thinkers.

Place-Based Learning

Let us look at the part of the spectrum of success that deals with education: enhanced learning, engaged students, critical thinkers. We know that students learn more readily when they are engaged with their environment. Place-based learning (PBL) is a learning process that connects students to place. Students explore and solve a real-life environmental problem or need in their local community. Educational standards are taught through tasks and processes the students complete through solving the problem.

Features of Place-Based Learning:

- The place is the context,
- The project/problem is the curriculum,
- Service learning,
- Real work: service to the community that solves a real problem or meets a real need,
- Student driven,
- Standards-based, and
- Partnership with community/collaborative effort.

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AAW has defined five critical elements to successful teaching and learning, using a PBL-based, service learning model. In it, students at all grade levels participate in:

1) Use of the local environment as a context for standards-based, integrated learning: Students participate in community-based investigations using a service learning strategy.
2) Watershed Monitoring: Students pursue long-term field studies in their watershed. Monitoring focuses on such things as water quality testing, soil erosion, wildlife, plant populations, and transportation issues all in the same area, over succeeding years. Community members help direct the field studies toward meeting the community's scientific needs.
3) Watershed Restoration: Students do hands-on work that meets real local needs. Students identify the needs through their own field studies in collaboration with watershed groups, and design the restoration projects in partnership with local stakeholders, including teachers, parents, businesses, natural resource specialists, community groups, and governments.
4) Community Education: Students share what they have learned with their community by hosting educational events or by producing media, such as posters, brochures, or videos. Community education projects, such as encouraging water conservation or labeling storm drains to discourage dumping of hazardous materials, benefit the watershed directly.
5) Reflection: Through reflection exercises, such as journal writing, students acknowledge the value of their work for their environment, for their community, and for themselves.

The impact of this approach on student learning is:

- Better performance on standardized measures of academic achievement,
- Reduced discipline problems,
- Development of problem solving,
- Increased engagement, and
- Greater pride and ownership.

Building Leadership

How does a community engage the people it needs to build successful leadership? Who does it start with? There are numerous **entry points** through which a program can start. It can begin through:

- Environment
- Education
- Community

Educators and students recognize more engaging learning systems. Resource agencies and environmental groups find effective ways to leverage their programs. Community groups, from environmental justice and health-related nonprofits to neighborhood gardening and preservation groups, gain partners to accomplish their goals.

The process begins with leadership.

Each community has the assets to grow their own programs. We can help our local community develop the leadership capacity to grow and sustain programs through six distinct steps:

- Develop a strong leadership team,
- Cultivate cultural competency,
- Build awareness and involvement with the community,
- Implement strategic planning and evaluation processes,
- Form a network of community partners that support the program, and
- Initiate place-based education programs.

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Adopt-A-Watershed works locally to build this leadership capacity, through our **Place Based Leadership Development Program.** We provide ongoing professional development and resources to help communities build high quality and enduring watershed education programs. We do so by following a strategically designed path that connects students, educators, and community leaders, all learning together. By applying training in leadership, networking, cultural competency, and educational resources and practices, we plan for success.

A favorite quote is, “I couldn’t wait for success so I went ahead without it.” It sounds inspirational, but in fact we have found that when our teams forge ahead, full of good intentions and can-do spirit, if they have not laid the careful groundwork within the community, if they have not taken the critical path, they fail. We have watched them, and we have even gotten caught up in their excitement and failed right along with them. That is how we have learned that, if we want to assure a sustainable program, certain things need to be put in place.

Our leadership training includes:

- Leadership skills,
- Strategic planning,
- Community vision,
- Systemic change processes,
- Partnership development,

- Evaluation and planning, and
- Fund raising.

Networking provides:
- Common evaluation tools,
- Common reporting and documentation of accomplishments,
- Information sharing,
- Professional development, and
- Regional student conferences.

Cultural competency is:
Professional development to help strengthen the capacity of the leadership team to be more intentionally inclusive of diverse cultures in their community and increase their ability to value cultural differences.

We provide a wide spectrum of educational resources:
- Programs, curriculum, technology, and tools of excellence,
- Standards-based instruction, and
- Understanding natural and social systems.

And train teachers in innovative Educational Practices:
- Place-based learning
- Environment as an Integrating Context (EIC)

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Conclusion

Our work is intense and goes deep into community needs. It requires commitment and dedication; it is not the right fit for those looking for a quick answer or "lite" solution. But, to successfully deliver any of the excellent programs you have learned about during the course of this conference, you will need to do this work—to build leadership at home, to engage the whole community. And in that way, you will lighten your own load and grow leadership in students—the stewards of the future.

"Be not afraid of growing slowly; be afraid only of standing still."
Chinese proverb
"Because, even if you are on the right track, you'll get run over if you just sit there."
Will Rogers
"A mind that is stretched by a new idea can never go back to its original dimensions."
Oliver Wendell Holmes

Maine's Dirty Little Secret: Selling the Concept of Soil as a Pollutant

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Abstract

For years, the Maine Department of Environmental Protection (MDEP) has provided outreach to educate the general public regarding the effect soil erosion has on water quality, run demonstration projects, partnered with local environmental groups, and administered a grant program that assists in BMP installation. Their efforts are all geared to reducing eroded soil, which is Maine's number one pollutant.

However, market research using phone surveys and focus groups indicates that most Mainers not only fail to recognize soil as a pollutant, they don't believe it when they are told it is Maine's greatest source of pollution. In order to assess our effectiveness (the opportunity to increase the level of the educational effort and increase people's understanding of what is polluting the water here in Maine), the MDEP engaged Market Decisions and Burgess Advertising to conduct a "test market." Research was conducted to assist in the development of a campaign; communications materials (including advertisements) were developed and then implemented in a limited test area. The results of this campaign were evaluated for effectiveness and then the costs extrapolated to estimate funding levels necessary for a statewide campaign.

Results from the test market were used to design a targeted media effort in various geographic regions of Maine over two summers. Each fall, a statistically valid market research phone survey was conducted to measure the effectiveness of the effort.

Results from the summer 2002 targeted effort indicate that 21% of respondents recall the ads, and 42% of those who recalled the ads correctly described a BMP that was encouraged in the ads. Twenty-three percent of the respondents said they had taken action to reduce soil erosion, with 73% of the actions they described being ones encouraged in the ads. Results from the 2003 effort also will be presented.

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Background

According to scientists at the Maine Department of Environmental Protection (MDEP), soil erosion is the greatest threat to water quality in Maine. However, market research, using a statistically significant phone survey over a number of years, clearly indicates that the public does not agree. The public does not recognize soil as a potential pollutant, nor do they think it is polluting the waters in Maine. See phone survey responses in Tables 1, 2, and 3.

Table 1. Phone survey responses to the top of the mind question:
"What common practices and activities in homes and communities, other than factories, are you aware of that contribute to water pollution in Maine?"

1996	1997	1998	1999
Don't know (34%)	Don't know (21%)	Don't know (33%)	Don't know (37%)
Septic systems (17%)	Septic systems (21%)	Septic systems (15%)	Septic systems (16%)
Household Chem. (12%)	Litter/trash (18%)	Auto oil/gas/antifreeze (11%)	Auto oil/gas/antifreeze (14%)
Litter/trash (12%)	Sludge/landfills (16%)	Sludge/landfills (10%)	Household Chem. (10%)
Auto oil/gas/antifreeze (10%)	Household Chem. (13%)	Boat pump-out (10%)	Fertilizer (9%)
Sludge/landfills (8%)	Auto oil/gas/antifreeze (12%)	Litter/trash (8%)	Pesticides/herbicide (9%)
Boat pump-out (7%)	Boat pump-out (12%)	Household Chem. (8%)	Agriculture (8%)
Agriculture (5%)	Pesticides/herbicide (10%)	Pesticides/herbicide (7%)	Litter/trash (8%)
Pesticides/herbicide (5%)	Fertilizer (8%)	Agriculture (7%)	Boat pump-out (8%)
Fertilizer (4%)	Agriculture (6%)	Fertilizer (6%)	Acid rain/air pollution (6%)

Table 2. Phone survey responses to the aided question:
"Which one of the following pollutants do you think represents the greatest threat to water quality in Maine?" Fertilizer, Failing septic systems, Waste discharge from boats, Eroding soil, Spilled gas/oil.

Spilled gas/oil products	35.4%
Fertilizer	19.9%
Failing septic systems	17.7%
Waste discharge from boats	11.3%
Eroded soil	8.4%
None of the above	1.5%
Don't Know	5.7%
Refused to answer	0.2%

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Table 3. Phone survey responses to the aided question:
"Which one of the following pollutants do you think represents the second greatest threat to water quality in Maine?" Fertilizer, Failing septic systems, Waste discharge from boats, Eroding soil, Spilled gas/oil.

Spilled gas/oil products	22.6%
Fertilizer	16.5%
Failing septic systems	15.2%
Waste discharge from boats	14.5%
Eroded soil	7.9%
None of the above	1.7%*
Don't Know	2.5%*
Refused to answer	19.2%*

* Note that 23.4% of respondents did not feel comfortable enough to even guess when provided answers.

Armed with this information, MDEP staff realized they had a big job ahead of them. They needed to raise awareness that soil is a very significant pollutant and get people to change their behavior to prevent soil erosion. This was particularly important in light of the new Erosion & Sediment Control Law, which the MDEP is charged with enforcing.

Therefore, the soil campaign began with the MDEP putting out a Request for Proposals (RFP) in the fall of 2000 for a "Pilot Soil Erosion Campaign." In November 2000, an advertising and a marketing firm were hired to develop and implement the campaign.

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Pilot Project

The existing phone survey data were used as a base-line regarding our target audience's present views and understanding of water quality issues. By having these data, MDEP was able to jump right into working on the issue. The advertising company developed test logos and slogans, which the market research company used when conducting focus groups. There were two focus groups held, one in Portland (Maine's largest city), and the other in the state capital, Augusta. Focus group members were selected to represent the demographics of our target audience. The focus groups provided invaluable insight into the target audience's perspectives, values, and motivation (See Table 4). Without the focus groups, the campaign would not have been as successful. Their feedback made it very clear that MDEP staff and our target audience do not think the same. If MDEP had decided to go with messages and images that inspired us, we would have failed to communicate through images and language that resonated with our audience.

Using the results of the focus groups, the advertising firm finalized the outreach pieces. They included logo, radio, newspaper, and direct mail postcards. All can be found at the Web site: <http://www.state.me.us/dep/blwq/doceducation/nps/materials.htm>.

Table 4. Initial Market Research (Focus Groups) Key Findings

1. Participants care a great deal about the environment. They are, at least on the surface, very knowledgeable about environmental issues and sources of water pollution. They could readily talk about many different issues and types of water pollution—from ones that are very obscure to ones that are prominent national stories. The diversity of issues discussed was remarkable.
   This suggests that communication on the importance of soil erosion, as a source of water pollution, would reach a receptive audience.

2. Participants get most of their information about pollution from the media, and they recognize the emphasis of the media on sensationalism.
   Information on water pollution from a credible source is likely to be well received.

3. Participants appear to be concerned about many environmental issues, and are not necessarily capable of sorting which issue is in fact the most important.
   Credible information on what is most important to focus on in order to reduce water pollution will be well received.

4. Soil erosion is not "top of mind" as a source of water pollution. Most do not know it's a problem.
   Consumers are unlikely to make stopping soil erosion a priority if they don't know it is a problem.

5. Participants can understand how soil erosion could be a major source of water pollution, but will need information from a credible source to fully believe it.
   Assertions that soil erosion is an important source or is the number one source of water pollution will need to be backed up by evidence delivered from credible sources.

6. Either of the two logos generates attention and gets important messages across. Participants liked the logo showing a river and fish because it created an emotional response for protection. Participants liked the logo with a tree because it dramatically showed eroding soil.
   By modifying the logo with the fish and the river to also graphically show eroding soil, this presentation may offer the best of both.

7. The tag line "It's a dirty secret, soil erosion is the #1 source of water pollution" effectively generates attention and interest on the issue.
   It may be preferable to use more than one tag line—an attention getting one followed by one that emphasizes individual action.

8. Participants suggested that the actions they could take to reduce soil erosion were impractical and others were unclear.
   It is likely that this campaign will be very effective in generating awareness. Citizens are concerned about the environment, receptive to information about causes of pollution, and the creative materials are on target and will attract attention and generate interest. The decision to take action may flow naturally out of this campaign—without much effort. Thus the campaign will beg the question, What should I do?

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In June of 2001, four communities in the Central Maine area were targeted in a four-week trial campaign. The communities selected represented the state's demographics and had affordable media outlets. Two of the towns received direct mail pieces and the others did not. This allowed for a comparison and evaluation of the effectiveness of the direct mail pieces compared to the other two marketing venues.

At the end of the four weeks, the marketing firm conducted a statistically valid phone survey of the households in the targeted communities. The results indicated that the campaign pieces were effective at raising awareness by 12%. Unfortunately, it was impossible to measure change in behavior due to the short time period. The survey results (See Table 5) also indicated that sending the direct mail pieces out cold was not as effective as the radio and newspaper ads. However, it was determined that the postcards would be more effective in local grass roots efforts by watershed or lake associations.

Table 5. Pilot Soil Campaign Summary of Results

1. The communications program achieved a high level of advertising awareness; 31% of the respondents recalled the advertising on an unaided or aided basis.

2. The newspaper and radio advertising appeared to be the most effective. The direct mail did not appear to be at all effective.

3. The communications appeared to have had an important effect upon some of the target population. For the first time, 12% of respondents mentioned soil erosion when asked about important sources of water pollution. Of those who recalled seeing the advertising, almost 70% could describe a specific action that could be taken to reduce soil erosion.

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Many who recalled the advertisements seemed to only vaguely recall specifics of the advertising. For example, many respondents said that they saw the ads on TV when no ads were run in this medium. Many could not recall what the advertising was about. We suggest that this lack of in-depth knowledge may be due to the issue not being directly relevant to many in the target market. Individuals may be concerned about water pollution, concerned about soil erosion, but may not see what they can do about it.

The total cost of the pilot project, which included development of materials, the media buy, and the market research, was $62,800. Table 6 provides a breakdown of the expenses. Note that 59% of the budget ($37,000) was spent on developing or testing the communications campaign. The rest was spent on delivery of the communications - printing, mailing, or purchasing the media for the campaign. In future efforts, expenses from the initial work may not need to be duplicated. Therefore, a much greater percent of the funds will go directly to advertising costs.

Table 6. Pilot Project Budget.

Study Component	Materials Development, Planning and Research	Budget program delivery (media buy, printing, etc.)	Total Budget
Focus groups	$ 8500		$ 8500
Advertising management	$ 6300		$ 6300
Concept and Logo Development	$ 5000		$ 5000
Radio Advertising	$ 3000	$12000	$15000
Print Advertising	$ 3000	$ 3500	$ 6500
Direct Mail	$ 2600	$ 9100	$ 8900
Media Placement		$ 1200	$ 1200
Post Advertising Research	$ 8600		$ 8600
Total	$37,000	$25,800	$62,800

As part of the pilot project contract, we asked the contractors to provide a statewide campaign cost estimate for the soil issue. To do newspaper and radio for residents over age 18 (in 2000 census that was 947,000 in Maine) the cost would be $306,900 (in 2001 dollars) to obtain the same level of recall. If we added direct mail, the total cost would be $418,847.

Equipped with these results, the MDEP had two choices: spend more money on tweaking the materials to make them more effective, or use them as is. Upon the recommendation of the marketing and advertising firms, the materials were used as is, based on their proven effectiveness and the program's limited budget.

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Targeted Soil Campaign

In August 2002, with a limited budget, the MDEP did a targeted soil erosion campaign in communities with active 319 projects, Total Maximum Daily Load (TMDL) studies, or active environmental associations. The campaign ran for four weeks and included radio and newspaper. The radio buy aimed at mid-week to end of the week air times. This was to try to catch people when they would be thinking about weekend yard projects, and to encourage them to prevent soil erosion while doing yard work.

At the end of the campaign, the MDEP again evaluated their effectiveness with a phone survey conducted by a professional market research firm (cost $2,575 for 5 questions). The results were impressive given that the survey was statewide, but the campaign only covered about two-thirds of the state. The results indicated that the campaign was successful in raising awareness. Of the 21% who remembered seeing or hearing the ads, 42% correctly identified a behavior (BMP) that was encouraged in the campaign. Of the 23% who said they had done something to prevent soil erosion, 73% named a behavior that was encouraged by the campaign. The responses to the phone survey questions had greatly improved over the previous four years of surveys, proving the effectiveness of the materials and placement in raising awareness and hopefully leading to changes in behavior.

Once more in the summer of 2003 (July & August), MDEP bought radio and newspaper space and placed the soil campaign ads over a four-week period. The effort was targeted, as in 2002, at people in areas with active 319 projects, TMDL studies, or active environmental groups. In 2002 the same advertisement cost MDEP $60,000, in 2003 it cost $63,000 ($19,646 for newspaper, and $43,180 for radio). In both years, radio stations provided bonus or match time since MDEP is a nonprofit, however newspapers do not offer this service.

MDEP is evaluating the effectiveness of the 2003 targeted campaign with the Omnibus phone survey conducted by a major marketing research firm in Maine, the same firm who has conducted the other research work. The phone survey will occur the week of October 8, 2003 so results are not available in time for the 3rd National Conference on NPS Information & Education Programs. MDEP staff will use the results from 2003 and previous year to determine the strategy for next year.

Lessons Learned

1) Focus groups are invaluable. Staff are too close to the issue and do not represent most target audiences, therefore their opinions will take you down the wrong path. Ask and listen to your target audience for terms, values, and beliefs that motivate them.
2) Using radio allows you to target the exact demographics you wish to hit rather than using a broad shotgun approach with the expectation of hitting your target. Radio stations know the age, income, and geographic area or their audience.
3) Using more than one medium seems to re-enforce the message for those who encounter both, but it also helps hit the part of your audience who may only read the paper or only listen to the radio.
4) Start early. It always seems to take longer to get RFPs, contracts, focus groups, and materials together. Timing can be critical. In Maine, running soil erosion ads in the middle of snow covered winter certainly has less impact than running them during the growing season, so delays in processing the contract or getting the media buy can affect your project.
5) Evaluation is critical to knowing if you are accomplishing your goals, for modifying your efforts, AND to justifying your efforts in these tight budget times. Although very crude, I can say 21% of Maine residents remembered encountering the soils ads. There are 974,000 people age 18 or older in Maine, which translates to 204,540 people who remembered the ads, at a cost of 34 cents per person. (Remember these numbers are not completely accurate as the campaign was not run statewide, but the phone survey was. They simply provide an estimate and reference.)
6) Keep focused on behavior change. When picking goals, be very specific about what you want people to do (the behavior) and then pick the tools to get the behavior change. Remember, awareness does not necessarily equal behavior (i.e., we all know eating high fat diets like McDonald's fries may not be good for us but we sure do eat a lot of them).

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Strengthening Education on Environmental Policy: Experience with Pennsylvania's Nutrient Management Act Regulatory Review

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Abstract

A recently completed project documenting the views of Pennsylvania nutrient management policy stakeholders illustrates the opportunity for the university extension service to provide timely and useful information to stakeholders and decision makers. Responses from 28 personal interviews provided insight into policy challenges, indicators of program performance, and future policy directions. This manuscript will describe the qualitative research methods used to document stakeholder views, present key findings, and summarize the demand for and use of the final report. Finally, the manuscript will include practical advice for educators looking to strengthen their public education programs on environmental issues.

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Introduction

Many audiences—farmers, local governmental officials, watershed organizations, and concerned citizens—have questions about rapidly changing environmental policies. Environmental educators have an opportunity to provide timely issues-oriented educational programs, "where people learn about public issues, policy-making processes, and opportunities for involvement and influence" (Hahn, 1990). Educational opportunities include identifying and helping audiences understand the complex issues giving rise to the policy changes, alternatives for addressing the issues, and the probable consequences of various alternatives.

While educational opportunities exist, few environmental educators carry out policy education programming in a comprehensive manner. Environmental policy education is challenging from both a content and educational process perspective. The issues are dynamic, driven by changing scientific research and policy developments, and complex. Enhancing understanding and providing balanced information to diverse audiences challenge educators. Additional difficulties include transferring time-sensitive information and motivating individuals and groups to participate in decision-making.

Through our experiences in Pennsylvania, we have identified several "ingredients" that are essential in a "recipe of success." These ingredients include:

- Financial commitment and administrative support for the educational program area;
- Presence within the environmental policy arena;
- Trust Building between the educator's organization and other stakeholder groups;
- Policy decision in the near future; and
- Balanced educational approach.

Our recently completed project to document the views of Pennsylvania nutrient management policy stakeholders illustrates the importance of these ingredients in environmental policy education.

Background

The Pennsylvania Nutrient Management Act (Act 6) was passed in 1993 and took effect in 1997. It requires all "concentrated animal operations" (CAOs) to develop and implement a state-approved nutrient management plan. A CAO is any animal production operation with more than 2,000 pounds of live weight per acre available to spread manure.

The State Conservation Commission, an 11-member government body, is responsible for implementing and enforcing this act. Chairmanship of the commission alternates annually between the secretary of the PA Department of Environmental Protection and the secretary of the PA Department of Agriculture. The commission relies on the Nutrient Management Advisory Board, a 15-member board established by the act, to review and comment on the regulations (Beegle et al., 2001). Most of the 67 county conservation districts have accepted local implementation responsibilities.

In 2002, the commission began its required five-year review of the density-based criteria for defining CAOs. This assessment has expanded to include an overall update of the regulations. Policy discussions are underway and changes to the Nutrient Management Act regulations will occur in 2004.

A decade after passage of this act, the regulatory revision process provides an opportunity for educators to provide useful environmental policy information to stakeholders and decision makers. These revisions will impact almost 1,000 CAOs and more than 800 volunteer (non-CAO) livestock and poultry operations. The changes will also provide environmental benefits for Pennsylvania citizens.

Extension's Role

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Penn State Cooperative Extension is actively involved in nutrient and water policy education. Historically, extension has focused on providing nutrient management expertise during the policy development process. Specialists trained in soil science, agricultural engineering, and animal production continue to contribute in this important role. This function has expanded to include social scientists that provide public policy information to stakeholders and decision makers beyond traditional agricultural audiences.

Since late 2000, administrative leadership within Penn State Cooperative Extension has increased its capacity in this program area by hiring one full-time fixed-term extension associate (the lead author) for three years to explore programming in this area. Additionally, one full-time permanent extension specialist (the co-author) devotes time to the environmental policy programming area.

Our presence within the state-level nutrient and water policy arena led to the opportunity to provide timely environmental policy education. Extension was aware that the process to update the Pennsylvania Nutrient Management Act regulations had started and was present at state-level policy discussions, where diverse stakeholder perspectives were shared. Once the window of educational opportunity was opened, we organized quickly to document stakeholder perspectives. Our goal was to provide a balanced educational resource that would lead to more informed environmental policy discussions.

Research Methods

We used qualitative research methods to document diverse perspectives, issues, and solutions related to nutrient management policy in Pennsylvania. Data were gathered through stakeholder interviews. Several documents were used to create a semi-structured interview survey: the Pennsylvania Nutrient Management Act and its rules, the Pennsylvania Nutrient Management Program manual, and transcripts from legislative hearings held during the spring of 2001. All questions were open-ended.

Extension's presence within the state-level nutrient and water policy arena made identifying interviewees possible. Informants were chosen on the basis of their involvement in current nutrient and

water policy discussions, or because of the stakeholder organization they represent. Additional interviewees were contacted through "snowball sampling," a technique where each was asked to identify other knowledgeable individuals. Snowball sampling is appropriate when a study is primarily explorative, qualitative, and descriptive (Atkinson and Flint, 2001).

We placed special emphasis on documenting diverse interests in nutrient management policy to create a balanced educational approach. Perspectives of farmers, agribusiness, agricultural consultants, government agencies, environmental interest groups, public interest groups, and educators were represented. Twenty-eight personal interviews (22 in person, six over the phone) were conducted in July and August of 2002. These interviews were no more than 90 minutes long. The interviewees were assured that their responses would remain confidential.

Due to the controversial nature of the subject matter, responses were recorded in writing by the interviewer instead of a tape recorder. While there may have been some data loss, we believe the approach created a more comfortable, informal interview, allowing greater information exchange. In most cases, the authors interviewed respondents as a team, with one person responsible for taking notes.

Four major factors increased participation. First, approximately half of the respondents were interviewed five years earlier, during a previous extension effort to document nutrient management policy legislative development and administrative rule making (Favero and Abdalla, 1997). Second, we built and maintained relationships with many of the individuals through state-level nutrient and water policy related workgroups. Third, the project was inclusive of diverse stakeholder views and rooted in a balanced approach. Finally, it was "informal"; no funding source existed. We identified a need, chose to devote considerable time to the project, and supported travel expenses with our individual extension budgets. This lack of specific funding also contributed to the perception that the project was balanced and objective.

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Stakeholder responses were collected and analyzed. Steps included compiling all responses to specific questions; identifying key phrases, words, and concepts; and summarizing emerging themes. The information or views obtained were not attributed to specific stakeholder groups.

To ensure that perspectives and ideas were appropriately documented and to emphasize the importance of each stakeholder's view, all interviewees were asked to review the draft research findings, and several interviewees provided written comments on the draft report. Interviewees who did not respond in writing were contacted via Email and/or telephone to ensure the draft report was received and to document additional comments.

Key Findings

Interviewee responses provided insight into nutrient management policy challenges, identified key indicators of program performance, offered broad conclusions about nutrient management policy-making in the state, and identified directions.

While we strived for a diversity of views on nutrient management issues, we were unable to be exhaustive and include all possible groups and individuals. However, due to the number and variety of interviewees, the findings are comprehensive from a statewide perspective.

We found that:

- Protecting water quality was perceived to be the ultimate goal, but not the only goal of the Pennsylvania Nutrient Management Act. Others include: providing assurance that agricultural nutrients are properly managed; creating practical and understandable regulations; protecting the environment without putting farmers out of business; balancing nutrients at the farm level with crop needs; and creating uniform, statewide nutrient management standards.
- The majority of respondents endorsed preemption of local manure storage, handling, and land application ordinances that are more stringent than the state requires. Support was based on the

perception that local officials had limited knowledge of agriculture and the need for uniform requirements across municipalities.

- Most respondents viewed the export of manure off of CAOs as necessary to protecting water quality. Exporting and redistributing manure to achieve on-farm nutrient balances was acceptable. They also believed that additional tracking of manure and the assurance of proper application was needed.
- Many acknowledged the need for phosphorus management, but raised concerns about managerial and financial impacts of implementing a standard that included both nitrogen and phosphorus. Some interviewees believed that the Phosphorus (P)-Index, a tool that identifies farm fields with a high nutrient pollution risk, is the appropriate tool to reduce these impacts. They believed this tool could make phosphorus management more acceptable in Pennsylvania.
- Most agreed that the Nutrient Management Act has been successful. Inclusiveness, leadership, education, and funding were viewed as key to this success. However, most interviewees identified at least one limiting factor. Examples of these perceived barriers include a regulatory implementation process viewed as non-inclusive; a lack of education for segments of the agricultural community; and county conservation districts perceived as too friendly toward agriculture.
- They envisioned an ideal nutrient management program to be comprehensive, addressing all farms causing water quality problems, adapting to new problems such as phosphorus, using a "systems" or watershed approach, and dealing with all nutrient sources.
- The key indicators of program success were identified as water quality improvement, farm-level compliance and implementation, economic acceptability, and public acceptance.

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Benefits

Hard copies of our report, *Nutrient Management Policy: Pennsylvania Stakeholder Views About Progress, Challenges, and Future Directions,* were distributed to more than 100 stakeholders. It was also available at Penn State Cooperative Extension's Nutrient and Water Policy Web site <http://agenvpolicy.aers.psu.edu/>. A Web statistics program, *WebTrends*, provides detailed information on the number of people who access this site and download the publication. Between December 2002 and May 2003, the report was downloaded over 2,000 times.

We presented our findings to the Nutrient Management Advisory Board, the State Conservation Commission, and the Pennsylvania Department of Environmental Protection's Chesapeake Bay Advisory Committee. The project highlighted our commitment to environmental policy education and increased visibility and political support. The State Conservation Commission invited us to present the report at four nutrient management planner meetings held around the state. More than 225 nutrient management planners, conservation district staff, government agency employees, and farmers attended.

Several key agency members provided unsolicited feedback on extension's involvement in and contribution to the meetings, which demonstrated an increase in political support. As a result of the impact from this project and other environmental policy programming efforts, the Penn State Cooperative Extension administration has extended the extension associate position to mid-2004.

Conclusion

Our commitment to balanced policy education, maintaining a presence within the state-level environmental policy arena, and building trust between extension and diverse stakeholders has proven useful in identifying and utilizing opportunities for environmental policy education. The use of

qualitative research methods to document nutrient management stakeholder views was instrumental in creating a beneficial educational resource, which resulted in more informed policy discussions.

Our educational philosophy is that improvements in policy come about through exchanging facts and perspectives about issues and solutions, participation by all interested and affected parties, and consideration of this input by public decision-makers. Environmental educators, as demonstrated in Pennsylvania, can facilitate this exchange, participation, and informed decision-making.

For others who want to become involved in environmental policy education we suggest the following:

- Conduct a needs assessment:
  - Are environmental policies and programs changing?
  - Are new groups affected by this change?
  - Are there opportunities for public participation in the decision-making process?
  - Are other groups, agencies, or organizations providing this education?

- Assess your organization's capacity:
  - Do administrators and colleagues value a balanced approach in public policy education efforts?
  - Are interdisciplinary efforts encouraged?
  - Do diverse stakeholders use your organization's educational resources?
  - Is funding available to support this educational effort?

- Inventory human resources:
  - **What are the instructor's values and beliefs about human behavior, the democratic process, and the role of education?** To be an effective public policy educator, he or she must believe in "enlightened self-interest," a well-informed citizenry, and that the democratic process will produce the right choice for society (Barrows, 1993).
  - **Is the educator a good listener?** Active listening is essential to understand the issues, recognize the stakeholder representatives, and identify educational opportunities.
  - **Can the educator build and maintain working relationships with diverse stakeholder groups?** Does the individual enjoy meeting new people? Is he or she willing to learn and acknowledge diverse values and perspectives? This openness will lead to a better understanding of the educational needs among diverse audiences.
  - Is the educator willing to devote time and resources to serve on state-level advisory committees and workgroups where diverse stakeholders are represented? Individuals who serve on these workgroups are often leaders in the state. We found that working side-by-side with diverse stakeholders strengthened relationships and demonstrated our commitment to education and the protection of water resources.

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Public Education and Sediment Pollution Trading: The Piasa Creek Watershed Project

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Abstract

The Piasa Creek Watershed Education Team Project (PCWET) is an academic environmental education project that allows middle school students to better understand the importance of water quality to their community and fosters a sense of stewardship for their watershed. Twenty public and parochial middle schools and two public high schools are currently participating in the project. It utilizes the watershed as an outdoor classroom for over 1,000 students in three southwestern Illinois counties. Through a comprehensive watershed monitoring program involving the latest educational technology, the students collect baseline data for determining long-term changes in the physical, chemical, and biological parameters of the watershed. The parameters include flow rates, sedimentation loads, temperature, depth, pH, dissolved oxygen, phosphates, nitrates, hardness, BOD, fecal coliforms and macroinvertebrate indices.

While the project places a strong emphasis upon the water monitoring component, it also uses the watershed as an outdoor classroom, thereby providing students with a better perspective of the dynamics of their watershed and an understanding of how human activity impacts the quality of water.

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Introduction

Piasa Creek is centrally located along the limestone bluff corridor of the Great River Road. It is an integral part of a biologically diverse region stretching from Alton, Illinois to Pere Marquette State Park in Madison and Jersey counties, Illinois.

The Piasa Creek Watershed drains approximately 70,000 acres in three southwestern Illinois counties. While the upper portions of the watershed are utilized primarily for agricultural purposes, the lower reaches have recently experienced wide-scale development. As the watershed approaches the Mississippi River, it becomes intensively residential. The lower portions of the creek have been channeled.

Piasa Creek is a major tributary of the Mississippi River, yet like so many other drainages, many residents of the surrounding communities view it as just a local creek. In reality, the watershed has a tremendous impact upon the quality of the Mississippi River.

In the fall of 1998, the Illinois State Board of Education funded the Piasa Creek Watershed Education Team Project (PCWET). This funding provided for the training of a cadre of teachers and students from seven Madison County schools (three public and four parochial high schools), and the establishment of seven permanent monitoring sites within the Piasa Creek Watershed. Water quality testing commenced on a quarterly basis at each of the sites. Physical, chemical, and biological testing parameters were established and data collection began at each site using EPA approved testing procedures. Field-testing was done at each site using the latest technology including flow meters, field laptop computers, and wet chemistry. Students began collecting base-line data to better build a long-range profile of the watershed.

Teacher Training Component

Twelve teachers were recruited to participate in the project (nine middle school and three high school teachers). Each of the teachers was given a post-assessment test dealing with water quality issues.

Since the scope of the project called for the integration of technology into the project, the project teachers attended six special technology training sessions. Each session was held after school and lasted for two hours. The grant provided stipends for this component. Each session consisted of instruction in the use of Apple E-mate laptop computers and the application of environmental sensing probes to obtain chemical and physical test data.

After receiving the technology training, the teachers participated in a two-day environmental education workshop dealing with water education topics, water monitoring protocols, and interdisciplinary topics. The training sessions were held on the campus of Lewis and Clark Community College, and were conducted by professional environmental educators, state agency representatives, and college faculty. The training consisted of both classroom and field experiences. During the field-training component, teachers were instructed as how to select, set up, and monitor a watershed study site.

At the conclusion of the training, teachers were issued equipment and supplies for their respective school teams (see equipment list).

Implementation

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The first phase of implementation began with the selection of student teams. The teachers were allowed a great deal of latitude in the formulation of their teams. Some teachers decided to use one of their classes, while others used a less traditional approach by forming environmental clubs or after-school project teams. Teachers were encouraged initially to work with somewhat smaller student teams composed of fifteen to twenty students. Later, as the teachers became more comfortable with the process, they expanded the number of participating students.

The second step in implementation involved the training of the student teams. Special sessions were held for each team and the project coordinator. The project teacher and high school mentors from advanced chemistry and biology classes did the training.

Training involved eight hours of lab and field time. During this portion of the training, students were introduced to the dynamics of watersheds using stream tables and a number of various curricula. During the field training sessions, students were exposed to the testing parameters and the significance of test results along with data reporting.

Testing Protocols

The three major testing parameters used by the project involved physical, chemical, and biological factors. While each of these factors provides valuable data about the watershed, a much more informative "picture" of the watershed is gained from developing a composite evaluation of all three factors (see data sheet).

The physical component involved selection of a permanent monitoring site. This was accomplished through the use of topographical maps and consultation with the local county soil and water conservation district personnel. Once the site was selected, a GPS unit was used to obtain map coordinates. Next was the establishment of the monitoring site. This involved using a metric tape and measuring off five meters of stream bank on both sides of the stream. The area was marked by driving four plastic stakes into the ground. String was stretched from stake to stake, forming a rectangular study

site. Sedimentation samples were taken within the designated study site using an Imhoff Cone. A student standing briefly in the middle of the site while facing upstream did this. After standing for thirty seconds, the student carefully filled the cone with one liter of stream sample. The filled cone would later be transported back to the classroom. After twenty-four hours, the sedimentation level was recorded in milliliters of sediment per liter of stream sample. Next, flow rates were determined using a digital flow meter, and the results recorded in meters per second. Maximum depth readings were obtained using a meter stick held perpendicular to the stream bottom. Depths were recorded in meters. A digital thermometer or a CBL (Calculator Based Lab) temperature probe was used to obtain air and water temperatures. Temperatures were recorded in degrees centigrade. Qualitative observations were made of the water such as degree of clarity, odor, and color. Stream bottom type (sand, cobble, mud, or gravel) was noted and recorded. A digital camera was used by student team members to record all aspects of the physical tests, as well as for documenting the overall topography of the stream at the site.

Chemical testing utilized wet chemistry and instrumentation. The degree to which each was utilized depended upon the overall ability and grade level of individual project teams. It was discovered that students above the sixth grade could use basic instrumentation, such as pH meters/probes, Calculator Based Laboratories (CBLs), and dissolved oxygen meters, while fifth- and sixth-grade teams were more comfortable with wet chemistry. Where elementary project teams utilized wet chemistry, high school mentors using instrumentation for data reporting purposes confirmed results. The chemical tests conducted were PH, dissolved oxygen, nitrates, phosphates, hardness, and biochemical oxygen demand (see data sheet). The project has piloted a variety of instrumentation and wet chemistry water monitoring kits over the past six years. The most applicable and useful instrumentation has involved CBLs, while the most user-friendly wet chemistry kits are those produced by "Chem Metrics" (see equipment list).

The biological evaluation component involved a fecal coliform screen. For database information and non-EPA reporting, the project utilizes "Petrifilm" (see equipment list). This is a cheap, quick, and accurate method for determining fecal coliform stream populations. For EPA reporting, a microfilteration process is required. The project employs the "Millipore" (see equipment list) process where precise numerical enumeration is required. Macro-invertebrates were sampled within the immediate stream study site using standard collecting protocols such as kick nets and "D" nets. The project utilizes a biological diversity index developed by the Rivers Curriculum Project for evaluation purposes.

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Data Synthesis and Reporting

Once parameter data had been obtained, each project team was involved in data evaluation and interpretation. Individual test results were compared to norms expected of healthy waters and a composite evaluation report made for the stream site.

Each project team electronically transmits all data to a central database maintained by one of the high schools participating in the project. These data form the basis for examination of long-term changes in the watershed. The data are also readily available for examination by various agencies and individuals.

Multidisciplinary Approach

Project teachers are encouraged to introduce a multidisciplinary component into the project through a variety of activities. These include map making, photography, student journals, stream art, poetry, and historical surveys of their watershed. Teachers are encouraged to involve other faculty members in their project by forming interdisciplinary partnerships.

Safety Concerns

Safety should be the number one priority when working with students in the lab or in the outdoors. Proper handling of chemicals and equipment should be stressed throughout student training. The use of safety goggles should be required of any student working with chemical reagents. A "chemical waste" container should be taken into the field to place all used reagents and samples in. A gallon plastic container, properly labeled, works well for this purpose.

Sites should be selected where the stream is not significantly deep or swift. If wading boots are used, they should be of the "hip" boot style rather than chest waders. Students should not be permitted to wade barefoot into the stream.

Students should be assigned appropriate tasks that will keep them focused on the stream monitoring, and idle time that might create potential safety problems should not be permitted.

Conclusion

Water holds a magic for students of all ages. Teachers find that there is little problem in motivating students to become involved in water education projects. In the Piasa Creek Watershed Education Project, teachers assume more of a role as facilitators. Students are allowed to make their own interpretations and evaluations of their watershed and develop their own perspective of the dynamics of their watershed. Students acquire a sense of "stewardship" for their environment, which encourages them to be environmentally responsible citizens both now and later in their adult lives.

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Equipment Recommendations:

Over the past six years a variety of supplies and equipment have been used in the PCWET project. After extensive piloting, the project recommends the following supplies and suppliers for a project team:

- 1-##94356 Flowmeter
- 1-#78052 Dissolved Oxygen Water Test Kit
- 1-#78054 Nitrate Water Test Kit
- 1-#78956 Phosphate Water Test Kit
- 1-#76917 Imhoff Cone with Stand
- 1-#5377 Aquatic Net
- 4-#93061 Rubber Hip Boots
- 1-#39974 Metric Tape
- 1-#89326 Digital Thermometer
- 1-#76325 pH Tester 2
- 1-#76126 pH Buffer 4
- 1-#76104 pH Buffer 7
- 1-#76127 pH Buffer 10
  - ▹ The supplier for the above is: Forestry Suppliers, P.O. Box 8397, Jackson, MS 39284-8397
- 1-#FB1173 Petrifilm 3-coli
  - ▹ The supplier for the above is: Flinn Scientific, P.O. Box 219, Bativia, IL 60510
- 1-CBL2 Calculator Based Lab System 2 with probeware and software
  - ▹ The supplier for the above is: Vernier Software & Technology, 13979 SW Milikan Way, Beaverton, Or. 97005-2886

- 1-#36W5422-Millipore Basic Equipment Set
  - The supplier for the above is: Wards natural Science, P.O. Box 92912, Rochester, NY 14692-9012

Misc. Items:

- 4-24Inch Plastic or Wooden Stakes (for marking off study site)
- 1-Nylon or Cotton Ball of Twine or Chord (for marking off study site)
- 1-Hammer (for driving stakes)
- 1-Meter Stick (for depth reading)
- 1-First Aid Kit (for emergency)
- 1-Digital Camera (for documentation)
- 1-Topograhical Map of Area
- 1-Waste Chemical Dump Container
- 1-Incubator 9for incubating Petri-film plates)
- 12-Collecting jars (for macroinvertebrates)

Enrichment Materials

There is an abundance of reference and enrichment materials available for teachers wishing to develop their own watershed education project. The following enrichment materials are well worth investigating:

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Cole-Misch, Stacy, Larry Price, and David Schmidt. 1996. Sourcebook for Watershed Education. Global Rivers Environmental Education Network, Ann Arbor, MI.

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Mitchell, Mark K. and William B. Stapp. 1990. Field Manual for Water Quality Monitoring, 4th Ed. Thomas-shore, Inc. Dexter, MI.

Murdock, Tom and Martha Cheo with Kate O'Laughlin. 1996. Streamkeepers Field Guide. Adopt-A-Stream Foundation, Everett, WA.

Rivers Curriculum Guide Series. 1997. Dale Seymour, Palo Alto, CA.

Terrell, Charles R. and Patricia Bytnar Perfetti. September, 1989. Water Quality Indicators Guide: Surface Waters. U.S. Department of Agriculture Soil Conservation Service.

DATA SHEET:

Team # _____Date:_____Time: _____

Name and Location of Waterway: _____

Water Source: _____ Stream Bottom Type: _____

General Appearance of Water: _____ Odor: _____ Color: _____

PHYSICAL TEST RESULTS:

Air Temperature: _____C. Water Temperature: _____C. Speed ___m/sec.

Maximum Depth: _____m. Sedimentation: _____ml/l.

CHEMICAL TEST RESULTS:

Dissolved Oxygen: ____mg./ or ppm. Nitrates: ____mg./l Phosphates: ___mg./l

Hardness: _____mg./l pH: _____units 5 day BOD: _____mg./l

Other Tests: _____

BIOLOGICAL ANALYSIS:

Coliforms: _____ per 100 ml. of sample

Macro Diversity Index Number: _____

Observational Notes:

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Solving the National Shortage of Watershed Managers: The Watershed Leadership Institutes

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Abstract

Symptomatic of an emerging water quality crisis are the swelling ranks of small watershed groups around the country. These groups operate in diverse watersheds that may be arid, or wet, facing growth pressures, or already urbanized, but what they often have in common is a shortage of both money and technical expertise. Many organizations are staffed exclusively with volunteers or with only a handful of paid employees, and while they may have a strong commitment to the health of the watershed, they often lack the skills necessary to make a difference on the ground.

The fact is that myriad effective technical solutions to many watershed problems already exist in the form of better site design techniques, watershed restoration and stormwater management practices, and watershed planning strategies. However, because of poor communication and training, many watershed managers either aren't aware of these solutions, or simply lack the skills necessary to implement them in their local communities.

The Center for Watershed Protection (Center) developed the Watershed Leadership Institutes (Institutes) to fill this critical gap in watershed management with a trio of residential programs designed to provide concentrated training in watershed restoration, watershed protection, and stormwater management. Along with technical skills training, the Institutes also include sessions designed to help watershed leaders expand the capacity of their organizations and make sure that projects actually get implemented. Sessions on strategic planning, project management, communication, and funding make sure that participants have not just the technical know-how, but the skills to build and maintain the solid organizational infrastructure essential to a healthy organization.

Both the Center and its teaching partner, River Network, devoted a great deal of research to developing the best model for the Institutes including market research, surveys, focus groups, consultations with peers and educators, critical reviews of our own workshop evaluations, and our experiments with various formats, resource materials and teaching methods in the more than 500 workshops we have jointly conducted over the last decade.

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Increasingly, clean water is becoming a scarce commodity throughout the United States. A wide spectrum of authorities have indicated that the twin problems of declining water quality and reduced water availability will only intensify over the coming decades, eventually representing a serious threat to our national health, economy, and way of life. In fact, the World Bank has observed that water will be to the 21st century what oil was to the 20th century.

Symptomatic of this emerging crisis are the swelling ranks of small watershed groups around the country. Almost 4,000 of these small watershed groups existed at last count, dedicated to causes that range from public outreach to watershed management to political advocacy. These groups operate in diverse watersheds (e.g. they may be arid or wet, face growth pressures, or already be urbanized), but what they often have in common is a shortage of both money and technical expertise. Many organizations are staffed exclusively with volunteers or with only a handful of paid employees, and while they may have a strong commitment to the health of the watershed, they often lack the skills necessary to make a difference on the ground.

The fact is that myriad effective technical solutions to many watershed problems already exist in the form of better site design techniques, watershed restoration and stormwater management practices, and

watershed planning strategies. However, because of poor communication and training, many watershed managers either are not aware of these solutions, or simply lack the skills necessary to implement them in their local communities.

The Center for Watershed Protection (the Center) developed the Watershed Leadership Institutes (the Institutes) to fill this critical gap in watershed management with a trio of residential programs designed to provide concentrated training in watershed restoration, watershed protection, and stormwater management. The Institutes' training programs are tightly focused, packed with an incredible quantity of information, and accessible to leaders of small watershed organizations around the country who may not otherwise have the time, money, or other resources to get the skills they need to be effective watershed managers. Above all, the Institutes are focused on intensively training watershed leaders in practical techniques they can put to work NOW to protect and restore their local watersheds.

Along with technical skills training, the Institutes also include sessions designed to help watershed leaders expand the capacity of their organizations and make sure that projects actually get implemented. Sessions on strategic planning, project management, communication, and funding make sure that participants have not just the technical know-how, but the skills to build and maintain the solid organizational infrastructure essential to a healthy organization.

The first Watershed Institute was held last month in Reisterstown, Maryland, a rural area west of Baltimore. Running from Sunday night through Friday afternoon, the Watershed Restoration Institute trained more than 80 watershed leaders, private consultants, and federal, state, and local agency staff to assess, design, and implement effective restoration programs in their home watersheds. Sessions were held from eight each morning to six in the evening and focused on urban watershed assessment techniques, stormwater retrofit inventories, stream rehabilitation, riparian reforestation, land reclamation, pollution prevention, watershed stewardship campaigns, and correcting illicit discharges. The programs included a mix of fieldwork, computer lab time, panels, discussions, and hands-on activities, and were designed to be as interactive as possible.

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Both the Center and our teaching partner, River Network, devoted a great deal of research to developing the best model for the Institutes, including market research, surveys, focus groups, consultations with peers and educators, critical reviews of our own workshop evaluations, and our experiments with various formats, resource materials, and teaching methods in the more than 500 workshops we have jointly conducted over the last decade. While the first Institute was a success by all accounts, we learned several lessons in our quest to create the best possible environment for learning and professional development. Over the course of six days and more than 30 sessions, this is what we found to be true:

1) Less is more. While the Center has a reputation for packing workshops full to bursting with technical information, we found that this did not necessarily make for the most effective knowledge transfer in a week-long residential setting. People can only absorb and process a limited amount of information. While participants appreciated the breadth of the Center's knowledge, they would have gotten more out of sessions that covered less ground, but provided more depth and detail. We found that this was especially true with the very technical sessions, where participants wanted less coverage, and more "specifics on how to take it to the next level." To strike a balance between quantity and depth, we provided a huge array of follow-up resources for participants to use back home via our aftercare Institute Web site.
2) Get people involved. While people can only process a limited amount of information in a single sitting, retention skyrockets when participants are given a chance to interact with material through discussions, exercises, and hands-on involvement. With this in mind, we tried to severely restrict our use of traditional lectures and PowerPoint presentations, in favor

of interactive exercises that forced participants to engage with both the material and each other. Sessions included a mix of computer work, small group exercises, field trips, and discussions, with field trips emerging as participant favorites. Although some lecturing was unavoidable, we made accompanying visuals as interesting, engaging, and user-friendly as possible.

3) Participants themselves are a wonderful source of information. A wonderful benefit of the increased interactivity built into the Institute sessions was that the participants themselves emerged as valuable resources. Attendees hailed from an incredibly diverse range of organizations, regions, and backgrounds, and were often able to provide new perspectives on particular problems or issues. During small group sessions and discussions, people shared their experiences with particular techniques or strategies, offered advice, and suggested resources or alternatives. In fact, one of the Institute's high points was the sense of community and collaboration engendered by these types of exchanges. Said one participant, "The combined expertise of participants and small group sessions made it all fall together better than just facts and figures." A number of people indicated how valuable this type of networking experience was for them, and several expressed interest in maintaining contact with other Institute attendees. In response, the Center established an informal Institute community online to facilitate continued information exchanges.
4) Collaboration is invaluable. If it takes a village to raise a child, it certainly takes a community to protect a watershed. Along with our teaching partner, River Network, a number of outside presenters and speakers collaborated with the Center to round out the Institute staff, presenting talks that encompassed everything from restoration case studies to foundation funding to leveraging EPA grants. The result was a wealth of outside perspectives that really helped participants get a full picture of what it takes to make protection and restoration projects happen. As well, participants appreciated the opportunity to question the GIS experts and grantmakers directly. One participant enthused, "It's good to hear other perspectives and approaches for work that we regularly undertake. Thanks for a great week!"
5) Make it relevant. For many participants, attendance at the Institute gobbled the entirety of their year's training budget, so making every session worthwhile for everyone was crucial. However, the diversity of Institute participants made a one-size-fits-all training approach impossible; some participants were trained engineers from local governments in the Midwest, while others were citizen activists heading up watershed organizations in the South. To meet this range of needs and interests, we divided participants into basic and advanced tracks for the technical sessions, and offered a choice of electives geared towards a variety of organizational interests on other days. While the tracking process was not without flaws, it was clearly essential that sessions be geared appropriately to need and skill-level. Plans are to make the session selection process more transparent at future Institutes, so that participants will have the opportunity to place themselves in classes they feel will best meet their needs.
6) Be flexible. With such a relatively short timeframe in which to impart a huge amount of information, we tried to make sure that participants were getting maximum value by scheduling activities tightly. What we found, however, was that while our preparation and planning was certainly essential to smoothly run sessions, the spontaneous tangents, discussions, and questions posed by participants often led the courses in unplanned, but ultimately fruitful, directions. We found that this type of participant-driven flexibility proved more valuable than even the most meticulously prepared agenda. Participants received the often very specific information they were looking for, and perhaps more importantly, they gained a sense of engagement with both the watershed community in general and the Institute community specifically. Participants left at the end of the week feeling not like students who

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have passed a class, but as members of a larger watershed community working towards a common goal. "I learned a lot, met many nice folks, and had a great time," exclaimed one northeastern Institute attendee, "This conference exceeded my expectations!"

7) Keep the momentum going afterwards. Experience dictates that the energy and excitement generated by even the best program tends to dissipate soon afterwards. To keep the momentum going, we built an "aftercare" feature into the Institute intended to help participants get up and running with the technical skills learned during the week's programs. As part of aftercare, Institute participants and/or their organizations are entitled to six hours of consultation with Center staff over the next year. While aftercare doesn't include funding for any travel or materials, Center staff can offer help with project scopes or plans, provide guidance on particular practices or implementation strategies, or just answer general questions. Another component of aftercare is the special Institute Web site, which contains electronic versions of all handouts, presentations, exercises and resources distributed during the week's sessions along with a wealth of other research and publications referenced during the Institute. Access to this Web site is free, but limited only to Institute participants. With all Institute participants connected through both the Center and the online discussion group, we hope that the spirit of collaboration and community will persist long after the week has faded.

It was evident from the enthusiasm, energy, and dedication of the Institute instructors, partners, and participants alike that the Watershed Leadership Institutes are primed to fill a very real need in the environmental arena. However, even with two more Institutes in the works and several more in the early planning stages, there remains a huge gap between the people who have the technical solutions to water resource problems, and people who are working on protection and restoration projects locally. Even with substantial scholarship subsidies, time and budget constraints push the Institute out of reach for some organizations, while others are simply too far away to attend easily. As a means of filling this gap, the Center has several other initiatives designed to help get information into the hands of the people who need it: the Stormwater Manager's Resource Center (SMRC) Web site, our Community Watersheds Program, and Watershed Leadership Distance Learning.

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Originally funded by the EPA, the Stormwater Manager's Resource Center's Web site <http://www.stormwatercenter.net/> boasts almost 3,000 pages of information focused on helping smaller communities comply with new NPDES (National Pollutant Discharge Elimination System) Phase II regulations. Users can download the components to build their own stormwater manual, examine model ordinances from around the country, view more than a dozen slideshows, get fact sheets on residential and commercial nonpoint source control, or look up other resources in our 600-reference library. The SMRC Web site currently gets more than 2,000 hits a month, and over the next two years, the Center hopes to secure funding to expand the site even further.

The Center's Community Watershed Program is another vehicle for delivering skills training and outreach/education products to smaller local watershed organizations, for whom affordable training opportunities, technical support, and resources have historically been scarce. These types of locally-based organizations make excellent watershed managers and advocates because they are usually unencumbered by political boundaries, government regulations, and local politics. The Center provides direct technical help to watershed groups undertaking assessment and restoration projects, and has developed a number of resources to help generate project and training ideas for organizations interested in educating local stakeholders on the impacts of watershed-related behaviors. Through funding from organizations like the Chesapeake Bay Trust and the National Fish and Wildlife Foundation, the Center is able to make our services and resources available to watershed organizations for free or at reduced costs.

Over the next few years, the Center hopes to secure funding to expand resources developed as part of the Watershed Leaderships Institutes and Community Watersheds Program and make them even more accessible via a dynamic Distance Learning Program. Envisioned to operate much like the online courses available from many major universities, the Center's Distance Learning Program will feature downloadable presentations, electronic publications, and other research complemented by structured real-time online discussions, instructor message boards, video clips, and required coursework. Groups who may not otherwise have the time or funding to attend a Center training program will be able to participate fully in an interactive learning community of Center staff and other watershed professionals, getting the skills they need to be effective watershed practitioners.

Certainly, there is a long way to go before enough trained watershed managers exist to champion every stream, lake, river, and estuary. It is our hope that programs like the Watershed Leadership Institute will help in our ceaseless mission to not only spread the watershed message, but also supply the practical tools to make protection and restoration happen.

CENTER FOR WATERSHED PROTECTION

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Enhancing Leadership and Managing Conflict through the "Know Your Watershed" Program

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Abstract

The Conservation Technology Information Center (CTIC) is a national nonprofit conservation organization dedicated to blending environmental and economic benefits to promote soil, water, and air quality, as well as habitat management through public/private partnerships. CTIC's *Know Your Watershed Program* offers several elements to assist with social capacity building for local watershed planning and implementation efforts, including eight guidance documents, or "Guides." This manuscript will delve into the lessons, tools, and tips provided in the "Leading and Communicating" and "Managing Conflict" Guides, as well as providing an overview of the other available tools through the KYW program and CTIC. The manuscript will revolve around the theme that diversity is an essential element for watershed groups, and harnessing the resulting conflict is what leads to productivity.

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Diversity

One important element of effective watershed groups is diversity. Ensuring that a diverse mix of ethnic backgrounds, gender, and public and private organizations are represented in local groups provides the different points of view essential for creative solutions. Diversity inevitably gives rise to conflict, and managing that conflict for positive results produces productive groups. Seeing conflict as an opportunity, as opposed to a negative force, is the key to harnessing the power of diverse groups.

Bringing diverse partners to a watershed group is accomplished by asking who in the community will be affected by the actions of the group. Every stakeholder that may be affected should be invited, even the potential troublemakers! Involving everyone early and giving each person a voice in the process fosters ownership and helps prevent derailment later in the process.

One activity that groups can use to identify missing partners is Asset Mapping (source: EPA's Community Culture and the Environment). In this exercise, the name of the group is put in the center of a flip chart page, and partner names are labeled along the edges of the paper. Arrows are drawn from each partner in to the group and labeled with what that partner brings to the group. Arrows are also drawn from the group to each partner and labeled with what the group brings to the partner. In this way, the 'WIIFMs' are identified, or 'what's in it for me.'

The resulting graphic depicts what each partner gains from the alliance, as well as what they bring to the group. This can be a powerful exercise to discover everyone's interests, as well as to fill in any gaps where additional partners should be recruited. The exercise also graphically depicts the strength in diversity. More partners bring in a range of resources and assets, increasing the overall time, energy, and money available to the group. After all existing partners are included, potential new partners can be identified and added to the page. Thinking outside the box during this exercise will help identify skills that would be valuable to bring into the group.

Conflict

Conflict is a natural result of bringing diverse partners together. Most people think of conflict as a negative element, and feel uncomfortable dealing with conflict in a group setting. A key to harnessing the power of diversity is to see conflict not as a negative, but as a natural disagreement due to different attitudes, beliefs, and values. Conflict is actually an essential ingredient of successful groups, and managing conflict leads to innovative solutions, new ways of thinking, alternative management options, and growth. Conflict is healthy when managed, and leads to highly productive partnerships.

In a productive group, the leader is facilitating decision making, not making the decisions for the group. Learning to guide the group through decisions is an important skill for watershed coordinators. Effective leaders concentrate on coordinating activities, keeping the partnership moving, and handling administrative details. Characteristics of effective leaders include good oral communication, listening skills, understanding individual participation styles, the ability to remain neutral, and most importantly, a sense of humor. Communication is the key to effective leadership, and the ability to listen is often more important than speaking.

Communication for Productivity

There are a number of communication strategies that watershed coordinators can employ to lead their groups effectively. Being clear about their role as a leader and standing firm that the group is in charge of decision making is an important lesson. Finding out each partner's "WIIFMs" also is important. This information can be used to make sure these needs are being met, while identifying and asking for the things each partner can bring to the group. It is often the leader's role to discover hidden assets partners can provide.

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Establishing ground rules is an important communication strategy. While some participants may find this exercise too 'touch feely,' it truly is an effective tool to manage group behavior and keep things on track. Allowing the group to develop the list of ground rules helps them take ownership of them, and may result in group members policing themselves when rules are broken! Keeping the list in a visible location during each meeting serves as a reminder of the commitment to work effectively, and can be referred to as necessary.

Some examples of ground rules include:

- Participate fully, share the air,
- Keep an open mind,
- Listen to learn, not to rebut,
- Question to clarify, not to corner,
- Disagree without being disagreeable,
- Come with perspectives, not positions,
- No whining,
- No sidebars,
- Work hard, and
- HAVE FUN!

Conflict Management

Managing conflict as a positive force requires a skill set that relies on listening, reflecting feelings and statements back to the group, and asking lots of questions. Facilitator training provides many tips and

tools for conflict management, and is valuable to anyone leading local groups. A few of these tricks include:

- Throwing questions that are posed by the group back to the group to answer themselves (Boomerang).
- Speaking up during quiet moments, for example, "It's very quiet in here, what does the silence mean?"
- Enforcing agreements that the group has made—either process agreements like ground rules or policy decisions that have already been hashed out.
- Acknowledging emotions and making deals with participants, for example stating, "I know you're frustrated. Can you hang in for 10 more minutes?"
- Asking "Why" repeatedly to reveal the hidden needs under positions.

Know Your Watershed Resources

The "Leading and Communicating" KYW Guide reviews leadership traits and teaches strategies for effective communication. It helps watershed coordinators gain a better understanding of leadership: what leaders do, who makes an effective leader and what is the key to leadership. Communication skills, including listening, discussion, brainstorming, and constructive feedback are reviewed in the guide. The reasons for communication barriers, and ways to give and receive feedback are included. In addition, tips for conducting effective meetings are offered.

The information in the "Managing Conflict" KYW Guide helps leaders understand and manage conflict, often encountered in local watershed work. The guide reviews the ingredients of conflict: needs, perceptions, power, values, as well as feelings and emotions. The steps for managing conflict, including analyzing it, determining a management strategy, and negotiating, are reviewed. Negotiation skills are included, such as separating people from the problem, focusing on interests rather than positions, developing optional solutions, and developing creative objective criteria.

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Additional KYW Guides include *Building Local Partnerships*, *Getting to Know Your Local Watershed* and *Putting Together a Watershed Management Plan*. There are also three guides on specific topics, including *Reflecting on Lakes*, *Wetlands,* and *Groundwater and Surface Water*.

Additional resources provided by the Know Your Watershed program include a searchable national network of watershed partnerships, a monthly newsletter and watershed quiz, a conference calendar, TMDL facts and links, a national library of resources, news archives, and Web links for additional information.

CTIC Services and Support

CTIC staff assist alliances across the country with business planning, ongoing support, and facilitation. Staff help groups develop mission and vision statements, priority resource and geographic concerns, priority action steps, timeframes for implementation, and success indicators. Training modules are available and tailored to each group's needs, and have included outreach, fundraising, and developing alliance structure. Awards and grants are available to local alliances each year. Additional resources are available on the CTIC Web site and through the alliance list-serve.

3rd National Conference

Nonpoint Source Pollution Information & Education Programs

October 20-23, 2003 * Congress Plaza Hotel * Chicago, Illinois

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